C.XIV.14
35618/B

NEW EDITIONS OF STANDARD WORKS.

1. PROUT ON THE NATURE AND TREATMENT OF STOMACH AND RENAL DISEASES. *Fifth Edition.* 8vo. 20*s.*
2. WILLIAMS' PRINCIPLES OF MEDICINE; COMPREHENDING GENERAL PATHOLOGY AND THERAPEUTICS. *Second Edition.* 8vo. 14*s.*
3. COOPER ON DISLOCATIONS AND FRACTURES. *New Edition.* Edited by BRANSBY COOPER. 8vo. 20*s.*
4. COOPER ON THE STRUCTURE AND DISEASES OF THE TESTIS. With 24 highly-finished Coloured Plates. *Second Edition.* £1. 10*s.*
5. LAWRENCE'S TREATISE ON RUPTURES. *Fifth Edition.* 8vo. 16*s.*
6. HOPE ON DISEASES OF THE HEART AND GREAT VESSELS. *Fourth Edition.* Post 8vo. 10*s.* 6*d.*
7. CARPENTER'S PRINCIPLES OF GENERAL AND COMPARATIVE PHYSIOLOGY. *Third Edition.* 8vo.
8. CARPENTER'S PRINCIPLES OF HUMAN PHYSIOLOGY. *Third Edition.* 8vo. 21*s.*
9. BIRD ON URINARY DEPOSITS; THEIR DIAGNOSIS, PATHOLOGY, AND THERAPEUTICAL INDICATIONS. *Third Edition.* Post 8vo.
10. RAMSBOTHAM'S PRINCIPLES AND PRACTICE OF OBSTETRIC MEDICINE AND SURGERY. *Second Edition.* 8vo. 22*s.*
11. WILSON ON DISEASES OF THE SKIN. *Second Edition.* 8vo. 12*s.*

    THE SAME WORK, WITH ENGRAVINGS ON STEEL, ACCURATELY COLOURED. 8vo. 28*s.*
12. BENNET ON INFLAMMATION, ULCERATION, AND INDURATION OF THE NECK OF THE UTERUS. *Second Edition.* 8vo. 12*s.*
13. PARKER'S MODERN TREATMENT OF SYPHILITIC DISEASES. *Second Edition.* Post 8vo. 6*s.* 6*d.*
14. LEE'S CLINICAL MIDWIFERY; COMPRISING HISTORIES OF DIFFICULT, PRETERNATURAL, AND COMPLICATED LABOUR. *Second Edition.* Fcap. 8vo. 5*s.*
15. GAIRDNER ON GOUT; ITS HISTORY, ITS CAUSES, AND ITS CURE. Post 8vo. 6*s.*
16. LISTON'S PRACTICAL SURGERY. *Fourth Edition.* 8vo. 22*s.*
17. DRUITT'S SURGEON'S VADE-MECUM. *Fifth Edition.* Fcap. 8vo. 12*s.* 6*d.*
18. TILT ON DISEASES OF MENSTRUATION, AND OVARIAN INFLAMMATION. Post 8vo. 6*s.*
19. JONES ON ANIMAL CHEMISTRY IN ITS RELATION TO STOMACH AND RENAL DISEASES. 8vo. 6*s.*
20. SKEY'S OPERATIVE SURGERY. 8vo. 18*s.*

WORKS ON CHEMISTRY.

BOWMAN'S INTRODUCTION TO CHEMISTRY; with numerous Engravings on Wood. Fcap. 8vo. 6*s.* 6*d.*

BOWMAN'S HAND-BOOK OF MEDICAL CHEMISTRY. With numerous Engravings on Wood. Fcap. 8vo. 6*s.* 6*d.*

FRESENIUS' INSTRUCTION IN CHEMICAL ANALYSIS.

QUALITATIVE. *Third Edition.* 8vo. 9*s.*

QUANTITATIVE. 8vo. 14*s.*

FOWNES' CHEMISTRY, AS EXEMPLIFYING THE WISDOM AND BENEFICENCE OF GOD. *Second Edition.* Fcap. 8vo. 4*s.* 6*d.*

GALLOWAY'S MANUAL OF QUALITATIVE ANALYSIS. Post 8vo. cloth, 4*s.*

GRIFFITHS' CHEMISTRY OF THE FOUR SEASONS. With Engravings on Wood. Post 8vo. cloth, 10*s.* 6*d.*

PROUT'S CHEMISTRY, METEOROLOGY, AND THE FUNCTIONS OF DIGESTION. *Third Edition.* 8vo. 15*s.*

CHURCHILL'S MANUALS.

Fcap. 8vo. cloth, 12*s.* 6*d.* each Volume.

AGGREGATE SALE 43,500 COPIES.

ANATOMY.—Erasmus Wilson, F.R.S.

CHEMISTRY.—Dr. Fownes, F.R.S.

MATERIA MEDICA.—Dr. Royle, F.R.S.

MEDICAL JURISPRUDENCE.—Dr. Taylor, F.R.S.

NATURAL PHILOSOPHY.—Dr. G. Bird, F.R.S.

OPHTHALMIC MEDICINE.—Wharton Jones, F.R.S.

PHYSIOLOGY.—Dr. Carpenter, F.R.S.

POISONS.—Dr. Taylor, F.R.S.

SURGERY.—Mr. Fergusson, F.R.S.

GRATIS, *by applying to any Bookseller in the United Kingdom.*

THE

"UNDERCLIFF"

OF

THE ISLE OF WIGHT;

ITS

CLIMATE,

HISTORY, AND NATURAL PRODUCTIONS.

Bankview
Venetian
Venetian Cove

Mount Clewes
St Catherines Terrace
St Catherines Light House

St Lawrence
Old Park
Cotlands
Cotlands on
St Lawrence
Banks End
Wilberforce Terrace

49054

THE

"UNDERCLIFF"

OF

THE ISLE OF WIGHT;

ITS

CLIMATE,

HISTORY, AND NATURAL PRODUCTIONS.

BY GEORGE A. MARTIN, M.D.

PRODESSE OMNIBUS.

LONDON:
JOHN CHURCHILL, PRINCES STREET, SOHO.

MDCCCXLIX.

WELLCOME
HISTORICAL
MEDICAL
LIBRARY

LONDON:
GEORGE WOODFALL AND SON,
ANGEL COURT, SKINNER STREET.

TO

SIR JAMES CLARK, BART., F.R.S.,

WHO FIRST CALLED THE AUTHOR'S ATTENTION TO

THE STUDY OF CLIMATE,

AND WHOSE KINDNESS AND ASSISTANCE

FURTHER ENCOURAGED HIM IN THE PURSUIT OF IT,

This little Volume,

WITH EVERY FEELING OF GRATITUDE AND ESTEEM,

IS DEDICATED

BY HIS DEEPLY OBLIGED AND ATTACHED FRIEND,

GEORGE ANNE MARTIN.

PREFACE.

It has been my wish, in putting together the materials I have been now some years in collecting, not to confine the information they may contain to any particular class, but to endeavour, in accordance with my motto, to make my little book "useful to all." With this view I have attempted to present to the tourist, or passing visitor, such a description of the district as my local knowledge has enabled me to give, and also to afford those who make a more lengthened sojourn, the opportunity of a better acquaintance with the place than the ordinary means within their reach might allow of.

While I have tried to avoid the exclusiveness of a mere medical topography, I trust the chapter more particularly devoted to the consideration of climate in connexion with disease, may be found to contain most of the subjects to which such a description is usually directed.

The Chapters on Natural History, Geology, and Botany, have been written with a twofold purpose; firstly, to afford the means of amusement to invalids whose strength would admit of their following such pursuits; and secondly, to give to the naturalist as full a description of the natural productions of the Undercliff as my means would allow.

The last Chapter is introduced as a brief record of the rise of the little town of the district, and to preserve from oblivion some interesting facts connected with it. I have been convinced of the necessity of this by the extreme difficulty I have had in obtaining dates from those who might be supposed peculiarly concerned in preserving such records.

The third Chapter I notice last, as being the most important, and requiring some explanation. It was my original intention to confine my subject to the meteorological facts I have been collecting for some years past; but it struck me that, however interesting such matters may be to a few, they are comparatively useless to the many; and I believed that by adding some practical inferences, and a popular account of the place itself and its natural productions, the book might be made more generally acceptable: hence its present form.

In consequence of the diversity of methods used in making meteorological observations, I think it right to describe the mode adopted in obtaining the results contained in the text.

The instruments employed are mercurial and spirit self-registering thermometers, *most carefully selected*, and compared with an excellent standard thermometer for some months, previously to making observations with them for my journal. After being thus tested as to their accuracy, they have been placed in a little observatory, built expressly in a *most exposed*, and, for such a purpose, unobjectionable situation. It consists of a thatched roof, supported on wooden uprights, partly resting against a wall; the whole being between eight and nine feet in height.

At a distance of about six feet from the ground small deal boards are fixed transversely, so as to give each pair of thermometers its proper aspect; and the roof is ventilated by a zinc chimney, for the purpose of preventing any accumulation of heated air from affecting the instruments, which are hung upon the deal boards just mentioned, each pair being placed opposite a cardinal point of the compass.

There is no building or high ground within a con-

siderable distance, and the whole has been so contrived, that the northern pair of thermometers, from which the results given have been derived, can by no accident be affected by radiation or reflection. The heights by actual measurement of three pairs of the instruments employed (including those to the north) are $153\frac{1}{2}$ feet above the sea-level at *spring tides*, while the remaining pair, which has an eastern aspect, is fixed under a somewhat similar building, at a height of 186 feet.

I have shown my observatory, and sought the opinion and advice of all those friends and acquaintances interested in meteorological pursuits who have visited the Undercliff, and have freely availed myself of their suggestions; and amongst them I may mention Mr. Newman, of Regent Street, to whose excellent instruments I owe much of the accuracy of my observations, and through whose suggestion I hope to add a set of electrical observations to my series.

Those who know the position of my observatory, will hardly feel inclined to accuse me of having selected a too sheltered or favourable situation; the remark of all who have examined it has been, that it is too much exposed, and likely rather to underrate the temperature than to over-rate it; my object, however, has been to

elicit *truth,* and I would rather understate facts than subject myself to the imputation of exaggerating them.

The observations have been taken regularly at 9 A.M. during the space of ten years (Dec. 1838 to Dec. 1848), *with the omission of only one day.* The amount of rain has been drawn off from the pluviometer every morning; and it may be here remarked that the unparalleled quantity which has fallen during the past year, will greatly affect the general average, and place it, perhaps, between one and two inches higher than it really is. I mention this more particularly as I believe no former observers in the Undercliff have registered, within some inches, so great an amount as that which has fallen in 1848.

The hygrometer and barometer have been observed regularly twice a day for a period of seven years, though the observations on the latter instrument extend through a space of ten years.

I think it right to describe the mode by which the results given in the tables were obtained, and have inserted a leaf taken from my journal, for the purpose of showing how the observations have been kept.

MONDAY, JANUARY 3RD, 1848.

Temperature out of doors.	Situation of Thermometer.				Mean of all the Situations.
	N.	E.	S.	W.	
Observation taken at 9 o'clock A.M.	50	50	50	50	50·00
Maximum in 24 hours.	52	51	52	52	51·75
Minimum in 24 hours.	44	44	44	44	44·00
Mean in 24 hours.	48	47·5	48	48	47·87

Temperature in doors.		Ranges of temperature.			
		Out of Doors.			In doors.
			Daily Range.	Successive Daily Range.	Daily Range.
Observation taken at 9 o'clock A.M.	50	N.	8	4·0	4
Maximum in 24 hours.	52	E.	7	3·5	Successive Daily Range.
Minimum in 24 hours.	48	S.	8	3·5	
Mean in 24 hours.	50	W.	8	3·5	2·0

Height of Barometer.		Hygrometer.			Quantity of Rain in Inches.	Direction of Wind.			Force of Wind.	Moon's Age.
Hour.		Hour.	Dew Point.	Attached Thermometer.		A.M.	Noon.	P.M.		
A.M. 9	29·83	A.M. 9	45	50	....	S.S.W.	S.W.	S.W.	Moderate.	26·6
P.M. 6	29·81	P.M. 6	46	50						

Weather and General Remarks.

Fair.

TUESDAY, JANUARY 4TH.

Temperature out of Doors.	Situation of Thermometer.				Mean of all the Situations.	Temperature in doors.		Ranges of Temperature.			
								Out of Doors.			In doors.
	N.	E.	S.	W.					Daily Range.	Successive Daily Range.	Daily Range.
Observation taken at 9 o'clock A.M.	49	49	49	49	49·00	Observation taken at 9 o'clock A.M.	52	N.	5	1·5	4
Maximum in 24 hours.	52	51	52	52	51·75	Maximum in 24 hours.	54	E.	4	1·5	Successive Daily Range.
Minimum in 24 hours.	47	47	48	47	47·25	Minimum in 24 hours.	50	S.	4	2·0	
Mean in 24 hours.	49·5	49	50	49·5	49·50	Mean in 24 hours.	52	W.	5	1·5	2·0

Height of Barometer.		Hygrometer.			Quantity of Rain in Inches.	Direction of Wind.			Force of Wind.	Moon's Age.
Hour.		Hour.	Dew Point.	Attached Thermometer.		A.M.	Noon.	P.M.		
A.M. 9	29·84	A.M. 9	42	49	·01	S.S.W.	S.	S.	Moderate during the day.	27·6
P.M. 6	29·86	P.M. 6	41	47					Fresh breezes at night.	

Weather and General Remarks.

Fair and beautiful during the day.—Some driving rain at night.

TEMPERATURE, ETC., FOR MAY.

OUT OF DOORS.

Mean Maximum.	Mean Minimum.	Mean Temperature of the Month.	Extreme Highest Temperature.	Extreme Lowest Temperature.	Difference.
66·58	53·38	59·98	74·00	46·00	28·00

Mean monthly Range.	Mean daily Range.	Mean succcessive daily Range.
13·20	13·19	2·48

IN DOORS.

Mean Maximum.	Mean Minimum.	Mean Temperature of the Month.	Extreme highest Temperature.	Extreme lowest Temperature.	Difference.
63·00	59·54	61·27	69·00	54·00	15·00

Mean monthly Range.	Mean daily Range.	Mean successive daily Range.
3·46	3·45	1·83

BAROMETER.

Mean Weight of Atmosphere.	Maximum Pressure.	Minimum Pressure.	Mean daily Range.	Extreme Range.
29·99	30·25	29·33	0·05	0·92

HYGROMETER.

Mean Dew Point.	Mean daily Range.	Highest extreme.	Lowest extreme.	Extreme Range of Dew Point.
49·45	2·66	56·00	38·00	18·00

PREVAILING WINDS.

	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
No. of Days.	1	3	15	2	3	4	..	3

PLUVIOMETER.

Absolute fall of Rain in Inches.	Number of Days on which any Rain fell.	Evaporation calculated from mean Temperature and mean Dew Point.
0·55	2 Days / 2 Nights } 4	10·53

The calculations were made from the thermometers placed in the northern aspect alone, as being the best situated for the purpose of obtaining accurate results. The maxima were added together at the end of every month, as were also the minima; and the total of each was then divided by the number of days in the month on which the observations were made; the mean maximum and minimum, thus obtained, being added together and divided by 2, give the mean temperature of the month. The daily ranges of temperature, being added together and divided also by the days of the month, give the mean daily range; and, for the purpose of detecting any error in the calculations, the mean minimum is subtracted from the mean maximum, and, if the remainder coincide within a fraction with the mean daily range, the result is of course correct.

The successive daily range is obtained by noting the difference of the mean temperature of each successive day, and the mean is arrived at in the same manner as the mean temperature and mean daily range.

The whole of the calculations are inserted in spaces especially appropriated to them in my Journal, under their several heads, at the end of each month, and the

results inscribed in a summary; a copy of which accompanies the copy of the leaf from my Journal.

I have been at some pains to ascertain how nearly the temperature of the Undercliff agrees at different points with the results here given, and coincident observations made at various periods, at Bonchurch, St. Boniface, Steephill, and near Niton, with instruments at about the same height from the level of the sea, approximate so closely to my own, that the Tables given may be assumed to apply to the whole range of the district.

The means of the barometer and hygrometer are obtained in a similar manner to those of the thermometer.

In the following pages should some repetition occasionally occur, I must hope the circumstances under which they were written will claim for me some indulgence.

The hours they have occupied have been stolen principally from those of rest; and many a rising sun has seen me at a work, which I have considered a duty. I have not unfrequently been obliged to break off in the middle of a subject which required much care and

attention, and have perhaps been unable to resume it for some time afterwards, when I have had to recall the ideas I had at first intended to express.

The arduous exercise of a profession, rendered more than usually painful and harassing by its peculiar character, has so fully engaged my attention, that little leisure has been left me for prosecuting pursuits to which I am much attached; and I have been consequently under the necessity of seeking the assistance of friends whose tastes in the subjects referred to were in consonance with my own, for the purpose of supplying me with such information as would render my imperfect notes more complete.

To the Rev. J. F. Dawson I am particularly indebted for the valuable assistance he has afforded me in the description of Birds and Beetles, and I must also express my obligation to my friend George Guyon, Esq., for further assisting me in compiling my catalogue of the latter class of insects. To Mr. Maitland my best thanks are also due for kindly supplying me with the valuable list of the Lepidoptera which his industry in collecting has enabled him to verify.

Without the aid of my excellent friend Edmund Peel, Esq., my notice of the Fishes of the Undercliff

must have been far more circumscribed than it is at present; and the papers of the Rev. C. A. Bury in the Zoologist have further furnished me with material in the chapter devoted to Natural History.

The kind exertions of my friend S. M. Saxby, Esq., in my behalf have enabled me to give, I have every reason to believe, a very accurate measurement of the Upper Greensand strata, and I am also greatly obliged to him for other information on the subject. From the valuable papers of Dr. Fitton in the Quarterly Journal of the Geological Society, I have drawn very largely, and must here express my obligation to them.

In the Botanical section, I have not trusted entirely to my own investigations of the floral treasures of the Undercliff; but the accuracy of the account will not be doubted when I mention that my kind and talented friend Dr. Bromfield has supplied me with the matter contained in it. I am also indebted to him for the observations on the springs of the Undercliff.

To the fair artist whose masterly sketches furnished the lithographer with the means of producing the admirable representation of the Undercliff which the Frontispiece presents, I am at a loss to express my obligation. Without the aid of her pencil I fear only a

very imperfect drawing would have been given, and my book must have been wanting in one of its most attractive features. To her belongs the merit of being the first, amidst the many whose pencils have delineated the beauties of the spot, who has produced a view (and a most faithful one) of the whole extent of the Undercliff, and all the lovers of the picturesque will do well to visit Hoody Point. To those friends who have further assisted me with their advice and suggestions I offer my grateful thanks, and trust they will find I have not slighted their judicious counsels.

Belgrave House, Ventnor,
Feb. 1849.

CONTENTS.

CHAPTER I.

PAGE.

Preliminary Observations 1

CHAPTER II.

General Aspect, Description, &c. 9

CHAPTER III.

Climate, &c. 52

CHAPTER IV.

Climate, with reference to Disease 113

CHAPTER V.

Natural History 161

CHAPTER VI.

Geology and Hydrology 246

CHAPTER VII.

The Botany of the Undercliff 297

CHAPTER VIII.

Town, Villages, Inhabitants, &c. 352

THE

UNDERCLIFF

OF

THE ISLE OF WIGHT:

ITS CLIMATE, HISTORY, AND NATURAL PRODUCTIONS.

CHAPTER I.

PRELIMINARY OBSERVATIONS.

So much has been said and written on this interesting locality, and so much general and valuable information has been given to the world, through the medium of Sir James Clark's excellent work on the "Sanative Influence of Climate," and, more recently, to the naturalist, in Mantell's *useful* little book on "The Geology of the Isle of Wight," that it might at first seem superfluous to attempt any addition to that which has already been so well described.

It appeared, however, that a more extended notice of the Undercliff might prove not unacceptable to a large class of persons, whom health or pleasure induces, for a greater or less period, to take up their residence under the protective influence of its romantic heights.

General impressions may, in the absence of direct observation, enable us to form some estimate, but too frequently an erroneous one, of the advantages or properties of various climates; but little dependence can be placed on the accuracy of reports founded on impressions alone: and it is much to be regretted that so little has yet been done by the medical profession, in obtaining accurate and just ideas of the peculiarities of various localities, more especially with reference to health and disease.

There are, however, many and valuable exceptions to this remark; and the excellent papers and works of Forbes, Symonds, Shapter, Scott, and many others, have imposed no small obligation on those who seek in climate the means of regaining health, as well as upon those whose duty it is to direct their wanderings.

It is gratifying to know that every succeeding year brings some new labourer into the field, and, however humble the endeavour, it cannot but be satisfactory to feel each has done his best in contributing his mite to the general fund whence others may acquire knowledge which they may apply to the amelioration of the condition of their fellow-men. The more general disposition in the medical profession to cultivate scientific pursuits is one of the signs of the movement which characterizes the improved condition of the age; and the various societies, existing for the purpose of a mutual interchange of information, prove that it is not insensible to the great advantages to be derived from

an intercourse which must necessarily tend to the diffusion of useful intelligence.

So interesting a field of research as that of topographical peculiarity requires only the attention of the intelligent medical practitioner to be drawn to it, to stimulate him in prosecuting those inquiries in his own neighbourhood, which may aid in determining our present vague and unsatisfactory knowledge of British climates in general.

Dr. Holland, when speaking of the advantage to be derived from climate in disease, remarks most aptly on the dearth of positive information, in reference to various climates: he says, "This is a subject on which fashion, hasty observation, and mistaken methods of inference in the world at large, have very great influence. Accordingly we find that our actual knowledge, though extended and better assured by two or three valuable works, is still wanting in certainty; and the practice founded upon it is often singularly vague and of doubtful benefit."

Climate is a subject which has long engaged the attention of the observant and philosophic physician. Its influence upon man, both physically and mentally, is prominently exhibited throughout all countries. The Bœotians, "Crassi Bœoti," contrasted strongly with the acute, lively and refined inhabitants of Attica. A quaint old writer remarks: "The clime changeth not so much the customs, manners, and arts of men, as the constitutions of their bodies and temperature itself;" and adds in another place, "he, therefore, that

loves his health, if his ability will give him leave, must often shift places, and make choice of such as are wholesome, pleasant, and convenient."

There cannot be a doubt that the health and vigour of the population of a country depend mainly on the salubrity of the situation, and the purity of the air they breathe. The hardy and enduring inhabitant of the mountain presents a strong contrast to the pallid and enervated occupier of the marshy plain, rife with pestilential miasmata, or to the sickly denizen of the crowded city. If climate conduce to the preservation of a healthy state of mind and body, how much more ought it to be prized as a restorative to the emaciated frame and drooping spirit. As a remedial agent its power has long been known, but perhaps never sufficiently valued. How often has the valetudinarian to bless the influence of the invigorating breeze, and how often is the frail and delicate being, whose tinted cheek and unearthly brilliant eye bear impress of the most insidious and deadly of diseases, preserved, at least for a time, to her anxious relatives, by the powerful influence of climate?

Before the valuable work of Sir James Clark, already alluded to, but little was known, comparatively, of the merits of the climate of many places in the British Isles, beyond their immediate vicinities; and the physician had no general guide by which he might direct his patient to the locality most suitable to his particular state.

A knowledge of the peculiar attributes of different

places is no small thing in directing the destination of the invalid; "regiones quas eligere, quas vitare," should form one of the subjects of due inquiry to the practitioner who, from his position, may be frequently called upon to direct the wanderings of his patient. A want of due study on this point has often been productive of serious, if not irreparable mistakes, the consequence of which has too frequently been, that the symptoms of the sick person have been aggravated, and the climate unduly censured. But, on some occasions, this has not been all: the reputation of the doctor has suffered, and his advice has not again been sought.

Too much care and judgment, therefore, cannot be exercised by the physician in selecting a suitable residence for the invalid; place and season are equally important, as well as those judicious changes of residence so essential after a lengthened sojourn in any of our favoured spots.

It is true, that our temperate but uncertain climate cannot vie, as a winter residence for pulmonary invalids, with the warmer climates of the more southern latitudes; yet it is generally in the incipient phases of phthisical disease that a foreign residence should be sought. In the more advanced stages, those alone who have witnessed it can form an idea of the speedy termination of this fatal complaint, when exposed to the influence of a tropical climate. It is not meant to assert here that many do not benefit, and enjoy, to a

certain extent, the prolongation of their existence, by a residence in a more genial clime; the case of the late Dr. Heineken, of Madeira, forms an apt example: yet how many are sent from their native shores to breathe their last sigh amidst, and dependent upon the care of, strangers, far removed from those for whose sake life was alone desirable. It may be questioned whether the bitter feelings engendered in the last hour by this sad separation, do not more than counterbalance all the anticipated advantages of a change to a foreign land. It is a lamentable fact, that a great number of invalids, in advanced stages of phthisis, are every year uselessly, may I not add cruelly, transported, to find a grave in the land of the stranger, who might have benefited quite as much by some favoured spot in their own country, within easy reach of the friends whose presence would prove a solace in their declining days, and smooth their pillow in the last dark hour. The "omne ignotum pro magnifico" weighs perhaps with some, and decides them on rejecting the prudent counsel of their professional adviser to remain at home; and they find, too late, that the unknown properties of a foreign clime exist but in their own sanguine imaginations.

All medical statistics relating to various places are valuable, and all facts regarding climate form a most interesting section in a series of such inquiries; and it perhaps may not be inappropriate here to urge my professional brethren who may be residing in localities

which present anything remarkable in the constitution of their atmosphere, or attractive in their physical conformation, to lend their aid in enabling the world to form a *just* estimate of them.

Useful and correct deductions can alone be gained from a mass of accurate observations, and great difficulty occurs, unfortunately, in obtaining available evidence for such a purpose. It may be asked why this should be the case, when of all classes of men, from their particular education and pursuits, medical men are the best qualified to prosecute such inquiries? It is difficult to propose an answer, unless it be that the constant harass attendant on an anxious profession leads the mind from objects which are estimated of inferior importance; or that others hold the subject in contempt, and are inclined to think little benefit is to be gained by change of place and, taking "cui bono?" for their motto, that time which is devoted to such investigations is thrown away. Let me assure those who incline to the latter opinion that their professional character will lose none of its importance by devoting a few spare moments to the acquirement of knowledge which may benefit their fellow-men. "Nothing has so much exposed men of learning to contempt and ridicule, as their ignorance of things which are known to all but themselves."

The few short remarks which head the Meteorological Tables in Sir James Clark's valuable work are perhaps, as general rules, a sufficient guide to those

who may be inclined to engage in so interesting an inquiry; but, to those who would enter more widely into the subject, the instructions contained in the Report of the Committee of Physics of the Royal Society, published in 1840, would be found useful in guiding them to the better methods of carrying out their object.

CHAPTER II.

GENERAL ASPECT, DESCRIPTION, ETC.

I INCLUDE under the name of "The Undercliff" that district which lies between Dunnose on the east, and Rocken End on the west. Its popular name would seem to imply its peculiar situation, "under the cliff;" but it has been known by the names of Underwarth, Underwath, and Underway. It would, however, appear that these names more particularly designated that portion which lay in proximity to Niton, as St. Lawrence is mentioned as St. Lawrence Undercliff, and the little chapel of Woolverton, situated still more to the westward, and consequently nearer to Niton, is specially referred to as Woolverton Undercliff.

The western extremity is about two miles more to the south than the eastern, which has the effect of giving the tract an aspect of south-and-by-east to S.S.E. The more favoured spots in this district, however, from the different inequalities of the line of coast, receding and advancing as it does, are those which face due south, and are situated in various little bays, or coves as they are here called. The principal and better known of them are Bonchurch and Ventnor. But there are other spots which have an equal if not

superior character for shelter than even these; the sites, however, are so limited that, were there no other difficulties in the way of building on them, they could hardly be made available for the purpose. Had the whole tract been otherwise occupied than it is at present, by the park-like pleasure-grounds and gardens of the resident gentry, no district throughout the whole of Britain could have afforded a wider scope for insuring to the invalid a most desirable retreat from the severities of an English winter.

The outline of the Undercliff, as seen from the sea, is bold and striking, and includes the range of lofty chalk-capped hills, which extend the whole distance from Dunnose to Black Gang, and whose substrata form the striking wall of rock so peculiar to the spot.

The view of it from the sea, however, is by no means its most pleasing aspect: yet, commencing our notice from the well-known promontory of Dunnose, we shall find much to please and interest the stranger.

The first object which strikes our sight, after passing the bold headland above alluded to, is the beautiful residence called East Dene. It stands near the site of a cottage formerly occupied by the clergyman attached to the parish, and its gardens and grounds present prospects of rare beauty. The house was designed by Mr. Beazly, the architect, who erected it for a Mr. Surman, about twenty-five years since; its fittings are of a most unique character, consisting, with its furniture, principally of ancient carved oak-work, the contribution, probably, of many a baron's hall or

hallowed fane, and derived chiefly, I believe, from the continent, whence it was imported at the time of the common destruction caused by the first French revolution. Among the various objects of interest is an organ of very ancient date, and which, tradition asserts, was formerly used by Elizabeth. The house was originally thatched, but a covering of slate has been substituted of late years; and other alterations, both in the internal arrangements and approaches, have been made by the present possessor, which have had the effect of admitting more light and air, and relieving the place of a certain sombre character which detracted formerly from its beauty.

Bonchurch, which next claims our attention, embosomed in its ivy-clad rocks and trees, giving it the appearance of perpetual summer, and whose small but venerable church and pretty villas break the sameness of the scenery, leaves hardly anything to wish to the admirer of the beautiful and romantic. Its flagstaffs and its mimic forts, together with the well-known Pulpit Rock, surmounted by its rustic cross, lend a further diversity to the scene, and perhaps the encroaching occupation of man has injured less (though it has much altered) the appearance of this sweet village from the sea than it may be said to have done on land.

Ventnor, with its new-formed town and pretty church, next takes its place in the panorama; but how different in every feature from its lovely neighbour! Two or three small spots crowned with lofty elms ap-

pear, from *the sea view*, all the foliage this vaunted spot possesses; the undulating tract of down pasture, called the Cow-lease, which separates it from Bonchurch, instead of adding to its beauty, as it does on land, gives it the appearance of barrenness when seen in the distance, the idea of which is much favoured by the bold chalky headlands which form its sea-face. Of the town itself, little can be said; houses placed here and there on elevated points, without a shrub or tree around them, appear to have just issued fresh from the mason's yard, and to have been set on one side as they were finished, ready to be fixed in more appropriate situations, as opportunity may occur. The little church, however, redeems, to some extent, this seemingly dreary and uninteresting prospect; its elegant spire, backed by the dark foliage of some lofty elms, gives that interest to the picture which before was wanting, and, as Mill Bay and the Cove open to the view, the scene again changes to the "lovely Undercliff," and the eye again rests on rock, and field, and tree; and, as Steephill comes in sight, it asserts its full right to all that has been said and sung of one of the most romantic and pleasing spots in Britain.

It must be borne in mind that this description of this rising little town is from its *sea aspect*, and that it is to the inequalities of the site upon which it is placed that it owes its seeming barren appearance. As the town itself will be more particularly noticed in another chapter, more will not be said of it here than that it is daily vindicating itself from the charge of

mud and dreariness, formerly brought against it, by the formation of well-drained and macadamized streets, with paved footways, and the judicious laying out and planting of numerous gardens attached to the various houses.

As we pass the Cove, the eye in vain searches for the picturesque little hovels of which every book that has been published on the island during the present century gave an engraving.

The innovating hand of man has swept away these memorials of the past, and, where the fishers' nets and crab-pot once occupied the scene, the coal-shed and the timber-yard now usurp their place! the "utile," but certainly not the "dulce" of the prospect.

A handsome esplanade has just been completed, which gives a character to the spot it did not before possess.

House upon house now shows itself, and a series of small terraces of buildings has been placed on the *punchbowl-like* piece of ground which was formerly called the Chicken Pits! The upper of these terraces faces the high road, and is now called Belgrave Road, one of the best and most cheerful situations in the town.

After taking leave of Ventnor, as we glance along the sea-face of the Undercliff, Steephill Castle opens on the view, and here, as I have before said, nature revels in beauty. Man can hardly desire a more lovely spot than this, which well may bear the proud title of the "gem of the Undercliff." Adjoining Steephill Cove, with its picturesque little huts, are the romantic sea cliffs called Western Lines. The immense masses of rock which

have evidently been disrupted from the original horizontal strata of the cliff are well worthy of the notice of the visitor and geologist. Tomkins, in his "Tour of the Isle of Wight," published in 1796, has given an engraving of this scene, but he has not been so happy in the execution of it as in many of the other plates the work contains.

Various little bays and coves now pass in review before us, as we proceed westward, along the coast, backed, every now and then, by the different villas and cottages with which, "longo intervallo," the line is studded. The pretty Elizabethan residence of the Hon. Dudley Pelham, seen just after passing the coast-guard station, with its look out, and the small forts which have been erected on the shore-cliff, give variety to the scene.

The Earl of Yarborough's marine villa, with its little temple and pavilion, next breaks upon the sight, and adds its tribute to the general beauty of the prospect.

St. Lawrence, with its tiny church, here comes before us, and forms a pleasing fore-ground to the rocky wall, which now assumes a definite form, and exhibits well the upper strata of the geological features of the spot. The weather-worn face of this remarkable barrier, from having lost the softer parts of its formation, breaks with its rugged points the formal appearance it would have presented, had it been merely a scarped rock.

Below St. Lawrence is the ruined chapel of Woolverton, formerly belonging to a family of that name,

and which, from being merely a private chapel with no regular endowment, most probably fell into decay when the descendants of the family failed, or parted with their possessions to others *.

Old Park is dimly seen through the foliage as we continue our course to the westward, and Mirables, embosomed in its shrubberies and trees, stands next in order, and is, alas! the only one now extant of those fairy-pictured retreats, which it pleased each scene-describing tourist to rave about in former days. Not only is the house the same as in olden time, but there yet flourishes, in a green old age, the spirit of the scene. The relict of its former possessor still resides there at a very advanced age, furnishing one among many instances that the Undercliff is by no means unfavourable to longevity.

The Orchard follows Mirables in aiding to adorn a scene whose beauty has often been described but never beyond its merits.

Pursuing still our western course, Puckaster Cove next claims our attention; here Charles II. landed in 1675, as every guide-book published since the event affirms, and which the parish register of Niton more surely attests, by an insertion of the fact by the Rev. Thomas Collinson, at that period rector of the parish.

The Cottage of Puckaster is sweetly situated, and the grounds, perhaps, of all the various and delightful

* There is a fine engraving of Binnel Bay, just below Woolverton, in Sir Henry Englefield's splendid work on the Geology of the Island.

points in this vale of beauty, approach nearer than any other to those of Steephill in perfection of romantic scenery.

Leaving Puckaster behind us, the buildings lately erected near the shore, just before reaching St. Catherine's Point, next attract our attention. It has been proposed to form a new town or village at this spot, and, though admirably calculated for a summer retreat, its exposure to the strong blasts which blow from the sea at some seasons of the year, evidenced by the set of the trees in the neighbourhood, renders it less desirable for a winter residence; and, being placed as it were on the western promontory of the Undercliff, the misty clouds which take the course of the high lands across the island settle more frequently at this point than at the eastern extremity. There are, however, some good lodging-houses now built here, called St. Catherine's Terrace, which let at moderate rents; and a large and commodious hotel has recently been constructed on the shore, which offers ample accommodation to visitors.

St. Catherine's Light House next forms a conspicuous object; this truly valuable guide to the storm-tossed mariner was commenced in 1838, from the design of Messrs. Walker and Burgess of London. The depth of its foundation is twenty-seven feet below the surface, and rests upon huge rocks, the vast débris of the cliffs above. The diameter of the foundation is thirty feet; and every means that art could devise was taken to insure its stability. It was

finished in 1840, and the light was first exhibited on the 1st of March of that year; it is supposed to cut the horizon at a distance of twenty-two miles, and has been seen at the Ower's floating light, a distance of twenty-seven miles. The height of the lantern above the sea level is more than 200 feet, and the tower itself above 120; it is cased with Portland and Purbeck stone, which already gives evidence, in its honeycombed appearance, of the power of wind and sea spray; the turret which surmounts it is composed of Penrhyn granite. The burners consist of four concentric wicks, surrounded by six refractors, on Sir David Brewster's principle, two hundred and twenty plate glass mirrors, and at the back four spherical reflectors. Sperm oil was first used in the burners, but at the present time it has been replaced by rape oil. Much inconvenience was at first felt from the large amount of moisture deposited on the glass windows of the lantern, which rendered the light less brilliant, and in a severe frost partially obscured it, from the thickness to which it froze. To obviate this, Dr. Faraday suggested the employment of bell-mouthed funnels, and with perfect success; the windows are no longer steamed, nor do the attendants feel the shortness of breath, parched lips and thirst, with which they were previously distressed.

The great utility of St. Catherine's light may be estimated from the fact, that since its erection no loss of shipping has taken place during the night on the neighbouring dangerous coast; whereas in former years

no winter passed away without some fearful disaster, and fourteen vessels have been known to be wrecked in one night in Chale Bay. St. Catherine's may, " par excellence," be called *the* Channel Light.

After passing the promontory or headland of St. Catherine's, upon which the Light House is placed, the eye rests upon little but a chaos of desolate barrenness; irregular terraces rise in majestic ruin, until we reach the far-famed Black Gang Chine; and the background is closed by the bold escarpment of rock called Gore Cliff.

This tract was the scene of the landslip of 1799; and so complete has been the ruin of what was once said to be productive land, that a few sheep and cattle are all that now attempt to find a scanty subsistence in this solitary waste. One or two little spots, however, give interest to the scene, and foremost among them is the too little known Sand Rock Spring. This is situated on one of the higher series of terraces, and above it is the little cottage, with its patch of wind-bowed trees, formerly occupied as a dispensary by the late Mr. Waterworth, the discoverer of the chalybeate. The situation is sufficiently desolate during the dreary storms of winter, and the little tenement seems perched upon the rock like the eyrie of an eagle, braving the howlings of the wintry blast. In summer the extreme purity and salubrity of the air, which vies with the mountain-breeze of the Highlands in giving elasticity to the step and vigour to the frame, more than counterbalances the solitary situation in

which it is placed. As more will be said hereafter of this particular tract, which, though not usually included under the appellation of Undercliff, yet from its similar situation claims an equal title to the name, I shall at present pass it by without further remark.

Two or three houses are here seen situated, in more or less exposed situations, in this romantic wilderness of rock, the principal of which is * Black Gang House, around which the present proprietor is encouraging the growth of trees and shrubs, and cultivating a garden whose success will form an oasis in this scene of apparent desolation. The hotel crowns the point above "the Chine," with which we terminate our description of the *sea-face* of this most interesting district.

Thus far we have attempted to describe the Undercliff as viewed from the sea, and although, with one or two exceptions, the scene is one of great beauty, yet, it bears but a slight comparison in this respect with what it really is, when each locality is more closely visited on land.

It may be true, that in some spots this beauty has been much, and perhaps unnecessarily, interfered with and defaced; yet, for the aptitude of all the different parts required to constitute a perfect picture, it stands almost without a rival, even when compared with the most striking and beautiful scenery in the kingdom.

The Wyndcliff in Monmouthshire has been sometimes not inaptly compared with the Undercliff, and

* Now called "Southlands."

there is, in some particular points of view, a striking similarity in their general features. But, although the former may boast of greater luxuriance in its arboreous mantle, the muddy water of the otherwise lovely Wye cannot be compared with the grandeur of that glorious sea which lends its aid in completing the picture of loveliness which the Undercliff presents.

We will now endeavour to trace it more particularly, and to describe the various passes by which this district is reached.

Who that has ever made the toilsome ascent of the hill after leaving Shanklin, on his way to the Undercliff, and felt the dreary influence of the bleak and darkened down which hems in his view, to the right, while passing Luccombe, has not been struck, when arrived at the summit of the hill, with the beauty and sudden change of the whole character of the scene? Before him, and almost beneath his feet, lies a headlong steep, the base of which is seemingly washed by the ever restless wave, whose sound, at the great height above it, reaches the ear only in a dull murmur. Let the eye be now cast to the right, and, should the light of day be flickering out with one of its soft summer sunsets, a scene as of fairy land breaks on the inquiring gaze of the stranger. The spot on which he stands is near the summit of that promontory so well known to mariners, Dunnose, and it is from this point, although, strictly speaking, not immediately forming a portion of the Undercliff, that we commence its description.

The deformities which the hand of man so pertinaciously imposes, wherever nature has shadowed forth more than her usual charms, are from this point greatly hidden, or form but a foil to the natural beauties of the scene. The little spire of the church at Ventnor takes a conspicuous place in the picture, and adds to, rather than detracts from, its appearance. The round tower of Steephill is seen in the distance, rising from amidst its grove of lofty elms, and beyond is the continuation of cliff and tree, till the view is lost in its ocean bounds.

The descent of the steep hill called "White Shute," towards Bonchurch, is formidable only in appearance, the sea being at least a quarter of a mile from the top, and the romantic scenery of the Landslip at East End intervening.

Not many years ago, however, it was a really rugged and dangerous pass; and some are still living who in their younger days deemed a visit to the Undercliff, by this route, a matter of adventure.

The little of romance left in this bold descent has passed away, and a new line of road, by a more gradual inclination, has been completed, if at the loss of some beauty, with at least an increase of convenience and of safety. Nevertheless, it were prudent in visitors, whose coachmen and horses have been accustomed to level roads only, to leave them at home, and to depend on the drivers and horses of the island, habituated as they are to a hilly country.

Turning to the right, at the bottom of the hill, we

reach, after a few yards of level ground, the beginning of the Undercliff.

A quarry, which has supplied the stone for building some of the houses in the adjoining village of Bonchurch, first strikes the view, and gives an idea of the geological structure of the district. House now succeeds house; and a line of detached villas, headed by a comfortable hotel, occupies one of the higher terraces, being backed by the natural wall of cliff from which the irregular masses lying below have at some far distant period been disrupted.

Again we descend, and the road, less steep, becomes also more interesting and romantic. We wind through a pass formed by ponderous fragments of rock crowned with overhanging ivy, and inclosed on one side with handsome trees, among which the umbrageous foliage of the chestnut and the graceful flowering acacia stand conspicuous, and ornamented on the other by the appropriate and pretty church just erected.

It is in making this last approach to the Undercliff that the following remark of Sir James Clark will most forcibly strike the traveller; "The transition of climate experienced in descending from the exposure of the open and elevated down to the shelter of the Undercliff will remind the Italian traveller of his sensations on entering the valley of Domo d' Ossola, after quitting the chilly defiles of the Simplon in an autumn evening. You feel at once that you have entered a new climate, and the luxuriance of the vegetable tribes which you find around you proves that

the impression made upon the senses has not been deceitful."

This is no flight of fancy, and no solitary observation; very many who have traversed the pass of the Simplon have made the same remark; and the following anecdote will further confirm the justness of the account, as coming from one whose perfect ignorance at the time of any peculiarity of climate possessed by the Undercliff entitles him at least to the position of an impartial observer. A German gentleman who had just arrived in England, and who excelled as an artist, had been told he would find abundant food for his pencil amidst the romantic scenery of the Isle of Wight, one locality of which was as little known to him as another. He had brought letters to me, and, having landed at Ryde in a cold drizzling day, he found little to court his attention there, but proceeded at once to the Undercliff, and delivered his credentials. I regretted he should have been so little favoured by weather, and expressed a fear that he would form an unfavourable opinion of our lovely island; "Not at all," he quickly replied, "I have just been spending some time beneath the brilliant skies of Italy, and nothing has struck me so forcibly as the similarity of feeling on descending the steep hill just previously to entering the little village at its foot (Bonchurch), with that experienced in making the descent of the Simplon to Domo d' Ossola."

Such an observation, made by a stranger totally unacquainted with anything that had been previously

said on the subject, confirms the correctness of Sir James Clark's remark.

We have now reached the entrance to the romantic little village of Bonchurch, and here the road divides to the right and left; the latter leads to the avenue gate of East Dene, to the Old Church, and also to the striking scenery of the Landslip at East End, as well as to one or two private residences. In the grounds of one of the latter, Undermount, stands an isolated rock, surmounted by its mimic battery and flagstaff, which has formed one of the themes of admiration of nearly every guide-book hitherto published. The little fort is, however, now dismantled, and its tiny artillery, whose iron mouths used to breathe their sulphurous defiance to each petty privateer of the enemy which came in sight during the last war, is now removed from its proud station, and has become the occupant of a saluting battery in the grounds of Mountfield, on the cliff below.

Connected with this rock is a curious fact, which, if previously unaware of it, would greatly puzzle the geologist who might seek to investigate the different character and position of the strata, and trace their relation to the cliff above, from which this fragment has separated. From the horizontal position of the stratification it would, at first sight, appear to offer a favourable opportunity for a close observation, which cannot so well be made on the higher mass. The only difference existing between them is, that he will find the various layers *completely inverted*. In the

universal wreck which must have taken place when the Undercliff assumed its present form, this rock must have fallen directly over; the original chalky crown becoming its base, and the lower stratum of sandstone forming the summit.

The village of Bonchurch has, as might be supposed, undergone, in common with the rest of the locality, much change; but the greater part of the old village still remains. The thatched cottages, with their low, shelving roofs and timeworn walls, sufficiently distinguish the more venerable portion of the village from its modern, trim, slate-covered neighbours. The myrtles, sweet-scented verbena, and other exotics, still flourish, as of old, before the doors of the former; and these wayside gardens, from the variety of the tender plants which bloom in their gay parterres, give each little plot the features of a conservatory rather than of a cottage garden, and fully attest the superior mildness of the climate. As the village will be described more particularly hereafter, we will pursue our route through it, merely glancing at the various objects of interest which present themselves on our way.

And, first, the little lake claims our attention, and forms no inconsiderable portion of the landscape which has so often called forth the skill of the artist.

The spot now occupied by it was formerly a willow-bed, cultivated, it may be imagined, like many others in the neighbourhood, for the purpose of supplying the fisherman with the materials for his crab-pots.

From the situation of the village, overgrown with lofty trees, although perhaps not crowded then with so dense a foliage as at the present time, it is easy to conceive, from its proximity to this swamp, that it contained the germ of certain endemial diseases; and consequently, previous to the year 1800, fever and ague are said to have prevailed here at certain seasons. About that period, however, the then proprietor grubbed up the willows, deepened the bed of the swamp, and formed the little lake now existing. It is supplied by a beautifully clear and running stream, which takes its rise at the foot of St. Boniface Down; the water is conveyed away by two or three different exits, situated at different points, and the sheet of water, instead of being merely a stagnant pool, as it might appear, is in reality an expansion of the little stream which supplies it, and which, after taking a subterranean course to the south-east, again appears at two different points, one of which rises in the grounds of Mountfield House, and then empties itself into the sea at Horse Shoe Bay; and the other finds its way out at the side of the churchyard, and falls, in a cascade, into the sea at the cliffs below East Dene. The character of a widened stream rather than a pond of water, which the lake possesses, may perhaps account in some measure for its being so rarely frozen; the sheltered situation is undoubtedly one cause which is unfavourable to the formation of ice; but the comparative rarity of the latter does not altogether depend on this circumstance. During a period of nearly half

a century it has not been frozen over more than six times sufficiently hard to bear the weight of a man.

Since the destruction of the willow-bed, and the formation of the lake, ague has been unknown, and fever has ceased to be endemial to the spot.

Shortly after passing the last thatched cottage on the right, and close to the spring, which supplies water of the purest description to the villagers, is some masonry of a pyramidal shape, now built into the wall which forms the boundary of the lake. This little monument was placed there by a former proprietor of St. Boniface, above half a century since, and consists of blocks of the different strata of stone found in the quarries called "the Pits," which then existed towards the western end of what is now Bonchurch Terrace, and is interesting as showing how far one excels the other in withstanding the ravages of the mouldering hand of time. The occasion of its being placed there was at a period when stone was supplied to the Government, for the purposes of building the saluting-platform and other works in the vicinity of Portsmouth; and the remains of a jetty still exist on the shore, below East Dene, from which the stone used to be embarked.

Emerging from the leafy canopy which overshadows the road, we reach the limits of the new township of Ventnor; the spot is marked by a stone inserted in the wall of a stable, and lettered N. P. and B. P.; it is the boundary of Bonchurch parish, which here

joins the ecclesiastical district of Ventnor, which belongs to the parish of Newchurch.

A little farther on, we arrive at the stables and farm belonging to St. Boniface House; and here the road divides into three different routes. We shall pursue the upper or more ancient one, which diverges to the right and takes us past St. Boniface House; the remaining routes will be referred to, when speaking of the town of Ventnor, to which they more particularly belong.

We have now taken leave of Bonchurch; and a more lovely spot is hardly to be found in Britain. A writer, describing it, uses the following rhapsody, which, to those fully acquainted with its beauty, may not appear too extravagant: "Take barren rocks, prolific soils, broken masses, elevated cliffs and precipitous descents, an expanded sea, a winding rivulet and tranquil lake, the wild flower-dell and the rich pasture, the peasant's hut, the farmer's yard, and the admired villa; employ the colours of the bow of heaven; let the motions of animated nature be within reach of observation; cover the whole with an expanded arch; light it with a summer's sun, and call it Bonchurch!"

St. Boniface House stands a short distance from the road, to the right, and is, together with its grounds, one of the most sheltered situations in the neighbourhood. It is backed by the down, whose steep green slopes here form an interruption to the

line of rocky wall by which the Undercliff is distinguished.

The "Wishing Well," situated some short distance from its summit, is a curious instance of a spring appearing at so great a height, when unsurrounded by more elevated ground; whence it derives its supply can only be matter of curious conjecture.

This spot, so long celebrated in the village annals, was a very few years ago nearly deprived of its celebrity. An old pensioner, who either rented the ground or was employed by other persons, in the hope of turning the spring to greater and more advantageous account, commenced deepening the "Well." A few strokes of his pickaxe, however, dissipated the illusion. The patron saint, or perchance the presiding naiad, offended at the sacrilegious intrusion, denied a further supply; and the water at once disappeared, and quickly percolated through the chalky marl, which had been disturbed around its sacred precincts. Whether the reprobate character of its invader frightened the spring from its propriety, cannot be told; but it is certain that, subsequently to his death and reformation, a few years after, the water again returned, and still affords a watering-place for the browsing sheep, and opportunity for the curious to sip at its hallowed fountain. The situation of the "Well" is readily seen from the road, by the bright green verdure of its sedgy precincts.

A story is extant, that vessels passing this spring used, in former days, to lower their topmasts in honour

of the saint. It is almost a pity to throw a doubt upon this saintly custom; but it appears far more probable that the "ancient mariner," fearing the fierce gusts of wind which blow with sudden violence from the high land about the promontory of Dunnose, usually took the precaution of lowering the top or upper sails, to prevent mischief happening from these sudden squalls.

There is another spot in the immediate vicinity, from which it is feared the mysterious mantle of romance, in which it has been of late years shrouded, must be removed. The "Pulpit Rock" has for some time past enjoyed a character of superior sanctity over other of its isolated fellows in the vicinity, and has almost vied, in this respect, with its neighbour the "Holy Well." The rude cross on its summit is imagined to have reference to some religious feeling connected with the honour before mentioned paid by mariners to the holy spring; but, alas! this idea has no foundation in truth. A former proprietor, struck with the picturesque beauty of its situation, planted a flagstaff on it, and called it "Shakespeare's Rock." A few years after, the scion of a noble house, then residing as an invalid at St. Boniface, caused the flagstaff to be removed, planted a rude cross in its stead, and from its elevated and commanding situation, resembling an ancient rostrum, named it "The Pulpit Rock."

The practice of the peasant lads descending the Down seated on the skull of a horse, as mentioned in

some former accounts of the island, has now become obsolete; and the race of villagers who performed this hardy exploit is fast fading before the heterogeneous crowd of strangers, which the erection of a modern town, and its vicinity, have brought together.

The custom, also, of resorting to the "Wishing Well" (crowned with chaplets of flowers on St. Boniface Day) no longer exists among the merrymakings of the native Damons and Phillises, but is buried in oblivion, in common with many other partially religious observances of the olden time in "merrie England."

Passing St. Boniface Down, we arrive at the hill which leads into Ventnor: at the top of this descent rises a crystal spring, which was one of the sources whence the mill-pond was fed; various causes have tended to diminish the former supply, but the pellucid stream still trickles down the roadside, and the basin at its head still affords accommodation to the wants of the immediate neighbourhood.

Pursuing our course through the sinuous streets of the town (of which more will be said in a later chapter), we pass the church, and, soon afterwards, a rock overhanging the road, which is sometimes a source of alarm to the timid passenger lest its ponderous crown should fall and crush him, and more than one wish has been whispered for its removal; there is, however, no cause for apprehension; its base is solidly placed, and the inclination of the strata being inland renders it probable that, if undisturbed by the officious hand of man, it may stand, as it has already done, for centuries, whilst its

removal would be a positive injury to the neighbourhood by exposing it to the full influence of the fierce blasts which now break their force against its rugged face.

On turning the corner of this rock, we arrive at the Cove, one of the best and most sheltered situations in Ventnor. The escarpment of the cliff which characterizes the Undercliff is, apparently, again presented here, immediately at the back of the houses which face the road; this rocky wall, however, is not a continuation of that from which those vast fragments have been disjoined which form the Undercliff, but is merely a continuous portion which has slid from above into its present situation, preserving the original horizontal position of its strata, and forms a striking background to the terrace at its foot.

Leaving behind us stone walls and slated roofs, we once more regain the romantic scenery of the Undercliff, and after passing Steephill Farm, situated just beyond the western boundary of the township of Ventnor, the rocky wall before alluded to, which becomes lost at St. Boniface, again appears in all its romantic beauty; copse and tangled thicket lend their aid in softening the picture, whilst the dark evergreen foliage of the ivy contrasts well with the verdure of turf at its base.

Steephill Castle next claims our attention, but it is only partially seen through the line of lofty trees under which it is approached. It has been erected within these last twenty years by its present proprietor, and

was the last work of Sanderson, the restorer of Henry the Seventh's Chapel in Westminster Abbey. There are, unfortunately, but few points of view from which this edifice can be seen to advantage, so as to embrace the whole of its proportions, and do justice to the talent of its architect; but it is considered by competent judges to be the best specimen of the abilities of its designer; and the entrance hall has been pronounced one of the happiest efforts of modern architecture.

The grounds are more extensive than they appear from the road, and contain all the beauty that nature, blended with the highest excellence of art, can impart to a scene scarcely to be surpassed in England. They were laid out by Page, of Southampton, under the superintendence of the refined and highly cultivated taste of the proprietor.

Steephill may be considered the most sheltered spot in the Undercliff; and the variety of rare trees, plants, and tender exotics which flourish in its grounds, in all the luxuriance of native wildness, bear ample testimony to the truth of this remark. The walks extend, in their various windings through the different terraces, to a distance of about three miles, and the numerous breaks of varied beauty, which every now and then burst upon the view, leave nothing to be desired by the admirer of nature in her loveliest form. The fig-tree grows here in all its native vigour, and some of a very large size are found in different parts of the grounds. One near the poultry cottage, at the western extremity of the

plantations, measures three feet and a half in circumference at a foot from the ground; and there is one trained against a wall in the garden, which covers a space of forty-nine feet. A number of considerable size also grow on the upper terrace, adjoining the rocky wall of the Undercliff, which rises above it to the height of thirty or forty feet. It is a spot remarkable for its warmth, although situated about three or four hundred feet above the level of the sea; it was formerly called "the vineyards," and, until these very few years, a number of vines could be seen climbing, in wild luxuriance, amidst the towering crags and ivy by which they were overhung. The fruit of the fig ripens well here, and, though the magnificent trees in the upper terrace are not behind their fellows in the lower ground for productiveness, yet the inroads made upon them by the feathered race rarely allow any of the fruit which grows there to reach the table.

Everything that can tend to the comfort or convenience of refined life is attached to this enchanting place; its conservatory is filled with choice exotics; the orangery contains some very fine and healthy trees, brought from France about fourteen years ago, and formerly in the possession of the Prince de Condé. The fruit and kitchen gardens, with the pineries and graperies attached to them, are extensive and productive, and the turreted wall by which they are surrounded harmonizes well with the style of the castle.

On one of the walls of the garden is a Banksia rose of unusual size; it extends over a space of twenty-one yards, and when in flower presents a perfect sheet of softened yellow.

A few years since I had the opportunity of walking over these grounds with Mr. Paxton, the celebrated horticulturist, and editor of the Botanical Magazine, and on having the lovely view pointed out to him which presents itself from the terrace in front of the drawing-room window, looking to the westward, he remarked, "I have visited nearly every place of note from Stockholm to Constantinople, but never have I seen anything more beautiful than this!"

Leaving the grounds of Steephill, we descend the hill at the foot of which formerly stood the little inn referred to in previous guide books, but which, with the few ruinous cottages around it, has within these fifteen years been removed, and the hill much lowered and improved. The old road leading to the Down above, and thence into the road to Newport, used to run between the castellated garden-wall and the grounds attached to the stables. It was closed about four years since, on the owner of Steephill giving other ground, for the purpose of widening and lowering the roads at either end of the old one. It still exists in all its pristine roughness as a private road for carts belonging to the domain; no carriage would now attempt its dangerous way, and one cannot but feel surprise that it ever claimed the title of a public road. Accidents on it were by no means of unfrequent occurrence; and

the proprietor of Steephill himself had, together with one of his sons, a narrow escape from serious injury by the overturning of a vehicle in descending this rugged pass a few years since.

Pursuing our way along the road towards St. Lawrence, we pass a sweet little cottage to the right, embosomed in trees, and a striking mass of rock to the left, decked with ivy, gorse, and brake. The former, which is the poultry cottage before alluded to, is occupied by one of the dependents at Steephill Castle, and is situated in, and at one extremity of the grounds; it has often been the envy of the passing stranger, while the latter woos the skill of the artist.

A mile of tolerably level and very sheltered road, possessing all the characteristic beauty of the district, brings us to the farm of Bank End, through the yard of which a path leads to the Preventive Station, and a little cove below it, in which the fishermen of St. Lawrence keep their boats and paraphernalia of their calling.

A short distance on, and to the left, is the pretty Elizabethan cottage of the Hon. Captain Dudley Pelham; its grounds partake of all the natural beauty of the Undercliff, heightened by the charms refined taste has bestowed upon them. The fine elm trees growing just beyond, on the same side of the road, point out the situation of the Earl of Yarborough's marine villa.

The well at St. Lawrence next forms a pleasing object, and is situated opposite to the entrance to the

house. The fertile imaginations of some tourists have invested this spring with various legends of sanctity; but, alas! painful as it may be to dismantle it of its garb of romance, we fear the saint never drank from its crystal waters, or endowed it with any supernatural qualities.

Ascending a short and abrupt hill where the road becomes narrowed between stone walls and lofty elms, we enter the little village of St. Lawrence. To the right, in a sedgy piece of ground, a spring of the purest water gushes out from the bank, and needs but a little temple to be erected over it, and a few imaginary legends attached to it, to make it vie with its sister fountain, "the Well." *

St. Lawrence village, with its thatched and ivy-crowned cottages, its fruitful orchards and productive gardens, has felt far less the progress of change than that of Bonchurch. The steep and narrow hill, the sides of which it lines, has been lowered and widened, and rendered less dangerous than heretofore, and two or three cottages have been cropped of their ivy, and slate or tile substituted for their covering of thatch; but the character of the place has been but little altered, and its beauty hardly disturbed.

On the summit of the hill stands the *small* and well-known parish church. It has undergone several slight alterations. A vignette in Sir Richard Worsley's

* This is one of the springs in the Undercliff, from which my friend Dr. Bromfield has taken a set of observations on the temperature.

History, varies, in the form and description of the belfry, from the well-executed plate in Tomkins's Tour; and both differ from the present one, the single bell being now suspended under a small Gothic ivy-covered arch; an entrance porch also has been, seemingly, added to the south, and four or five years since the church itself was elongated, by throwing out a new chancel. The addition, although depriving the edifice of its former boast of unequalled diminutiveness, has hardly detracted from its picturesque appearance, and a very few years, from the judicious manner in which the alteration was effected, will be sufficient to efface every vestige of freshness, and the whole will partake of its general antiquated character.

The view of Steephill Castle, from the gate entering the field by St. Lawrence churchyard, is one of the most pleasing that can be obtained of this handsome structure, and the spire of Ventnor Church, before the erection of an unmeaning row of badly placed houses beyond it broke the harmony of the scene, added, in no inconsiderable degree, to the interest of the picture. An artist should not neglect to visit this spot when the softened rays of an autumn sun are casting their last tints on the line of cliffs and foliage which form the background of this lovely view.

The pathway through the gate just mentioned leads to the ruined chapel of Woolverton. There are three places of this name in the island, "Woolverton in Bimbridge," as it was formerly called, and mentioned as a parish; the "Manor of Woolverton," in the

parish of Shorwell, and "Little Woolverton Underwathe," to which we refer. The latter seems to have belonged to the proprietors of the first-mentioned estate, and the chapel was probably built by a member of one of the families (possibly one of the De Aulas) who originally possessed St. Lawrence. Its erection has been ascribed to Sir Ralph de Woolverton in 1370, but a much higher date, viz., 1129, has been assigned as the period of its construction; but we have no sufficient grounds for verifying the truth of the assertion. It appears, however, to have been merely a private chapel, and, from the want of any regular endowment, to have sunk into its present state of ruin and decay. Yet, it seems probable that, although bearing the same name, it did not derive its origin from the family of Woolverton, in whose possession there is no record of its ever having been. It fell into the Russell family, on the marriage of the heiress of Thomas de Aula, the possessor of St. Lawrence. From the Russells it descended, in right of marriage, to John Hacket, the then possessor of "Woolverton in Bimbridge," and again by marriage, into the family of Leigh, through whom it descended to the Worsleys.

On reaching the summit of the rising ground beyond St. Lawrence Church, we arrive at the foot of the steep hill leading through one of the passes of the Undercliff to Whitwell, and thence to the centre of the island.

This road, or, as it is called in the vernacular, "Shute," was cut through the rocky barrier by one of the Worsley family, at a point which appears to have

been favourable to the undertaking. It has been lowered at various periods, in consequence of many serious and fatal accidents occurring from its steepness, as the records of the neighbouring little churchyard can testify: it is even now a very sharp declivity, and one that is as well avoided by drivers and horses unaccustomed to the island.

At this part of the Undercliff, we approach close to the rocky escarpment which forms its northern boundary, within a distance of little more than fifty yards of which, the road continues until soon after passing "the Orchard."

There are several gates on the public road marking the boundaries of various properties; some of these have been already taken away by hands less scrupulous than those armed with legal authority, but a recent order has been issued by the magistrates to effect the removal of the whole, and many improvements for the public advantage respecting the Undercliff road are in contemplation *.

A short distance from the foot of Whitwell Shute, and close to a mass of rock abutting on the road, is a footpath, or bridleway, leading to Whitwell; it is not advisable, however, that the equestrian should attempt this route, as he will find some difficulty in passing a little gate near the summit of the cliff.

Masses of rock of ponderous magnitude occasionally detach themselves from the cliff above, and by their

* Since the above was written, the gates have been removed, and the road widened and improved.

fall spread ruin around them. A fall of this description occurred early in the morning, during the spring, about five years since, close to a gate then standing there, which was broken in pieces, and a little hut adjoining utterly demolished: the road itself was strewed with fragments; and, had any person been passing at the time, the consequences might have been most disastrous. A year or two afterwards, a similar slip took place a few yards further on; and, on each occasion, several tons of rock fell from their original situation.

The scenery along the road is now of the most enchanting description; the undulating character of the ground breaks the sameness of the picture, and calls forth new beauties at each turn. The woody dells, by which the road is bounded on the northern side, afford a shelter to the numerous nightingales with which this locality abounds, and whose mellow notes re-echo from rock to rock during the bright nights of spring.

Soon after passing an entrance gate to the left, and which leads to Old Park, we enter a most lovely part of our route. A bright summer's day best exhibits the scene in all its exquisite beauty; it is a picture to which the pencil of a Creswick can alone do justice, and must be visited to be appreciated.

The house and grounds of Mirables lie to the left, amidst the groves of stately trees by which they are surrounded. The house is scarcely seen, but it is one of the few residences in the Undercliff which has maintained its pristine character of a cottage, and the

unfaded beauty of its situation still justifies all the glowing descriptions of former days.

The scenery again becomes diversified, and perhaps may be considered by many the more beautiful portion of the route.

The broken foreground on the right, covered with its velvet herbage, its bold masses of rock and miniature dells and brakes, backed by the towering cliffs, renders it a scene replete with beauty, whilst, on the left, the bright foliage of its wooded glens, extending to the very strand, with the deep blue sea beyond them, form a prospect of surpassing loveliness.

After reaching the summit of the hill in this broken ground, through which the road winds, "Puckaster Cove," with its little fishing huts and boats, is seen to the left, and on the right is the foot-track leading to "Cripple Path," a narrow steep ascent, by which the upper part of the cliff is gained, which is here, probably, from between one and two hundred feet in height. It is at a short distance from this spot that Karanhappuck Newnham, or "Happie Ninham," as she is called in the vernacular, took her adventurous and unintentional flight, some few years since, and landed safely, with the exception of a few scratches and bruises, among the bushes in the broken ground below*.

* This young woman, then a girl of about fourteen, in passing along the path at the summit of the cliff, during a boisterous day, had dropped a basket she was carrying in her hand, and, in her anxiety to save it from going over the height, fell over herself with no other injury than is related in the text.

The road now becomes contracted, and is bounded by slender lofty trees, which have been apparently drawn up rapidly by the inclosed situation and fertile character of the soil.

"The Orchard," the offices and stables alone of which are seen from the road, lies to the left, and "Beauchamp Cottage" to the right hand.

After passing this spot the road continues narrowed between its stone walls and rocks; and there are but few places where two carriages can pass with ease, but it is to be hoped that this portion will before long be included in the category of intended improvements, as the widening the road at this point will in no way interfere with the beauty of the scenery, whilst it will be, to a certain extent, a security against accident in the event of horses running away on this now much frequented road.

The bold face of the cliff now recedes from its vicinity to the road, and the strata are admirably seen "in situ" in the distance, the position of the free-stone stratum and the harder rag and chert are well delineated.

The road branches to the left at the distance of about a mile after passing "the Orchard," and leads to "Puckaster Cottage;" and a further subdivision takes the traveller to the new village of Niton. This consists of a row of detached houses called St. Catherine's Terrace, to which I have before alluded, and which offers accommodation to a limited number of visitors, at moderate rents. One or two private re-

sidences have also been erected on this spot, which, with their growing plantations, tend to relieve it from its former barren character.

Pursuing the main route, we descend a slight hill, from the summit of which "Westcliff," embosomed in its shrubberies and trees, forms a beautiful and imposing object. The "Well House" lies at the foot of the descent, on the left, and the pretty villa residence, "La Rosiere," on the right.

The main road at the turnpike strikes off to the right and left; the latter leads to the village of Niton, about half a mile distant, and the former to the Sand Rock Hotel, and, further on, to Black Gang. Passing through the toll-gate, and continuing the road to the left, the distance of a few hundred yards brings us to the entrance of the grounds of the hotel, as also to the gate of the carriage drive leading to "Mount Cleves." The former bears as little resemblance to the class of establishments usually bearing such a name as is compatible with its obligation to receive travellers. It forms a delightful retreat, during the summer months, for those who wish to take up their residence for a short period amidst the most beautiful scenery of this enchanting island; and the advantage of shelter it possesses in common with the rest of the Undercliff, the comforts which it offers within, and the absence of that continued bustle and change consequent on the crowd of its summer visitors, render it by no means an undesirable abode during the months of winter; especially to such as seek that complete

retirement and repose so frequently necessary to invalids.

Pursuing our course to the westward, we here turn the point having "Gore Cliff" surmounted by St. Catherine's Down for its inland boundary, and St. Catherine's Point with the Light House on it at its sea extremity. This turn gives the remaining portion of the Undercliff a south-western aspect, and consequently causes it to be exposed to the strong gales which so frequently occur from that quarter during the winter months.

Buddle Farm is passed, at the turn of the road leading to the new houses at St. Catherine's Place and the Light House, and the old farm of Knowles is situated near the latter erection.

We now enter the scene of devastation caused by the great landslip which occurred in February, 1799. Nearly fifty years have elapsed since that event; yet, the soil is only just becoming fitted for those purposes of cultivation, of which the other portion of the Undercliff has long since shown itself so fertilely capable. Plantations are being made in various spots, and though the young trees suffer from the violence of the winds, in consequence of the exposed aspect, still nothing but time is wanting to render this dreary tract as well qualified for agricultural purposes as other portions of the land in the neighbourhood. In confirmation of this, some fields, which have been recently sown with grain, have amply realized all the expecta-

tion that could reasonably have been formed of their capability.

About midway between the Sand Rock Hotel and Black Gang stands the little cottage attached to the Sand Rock Chalybeate Spring; and here we have a totally different climate from that which exists throughout the region we have been exploring. Here the mountain-breeze is inhaled in all its purity, and the exclamation of surprise made by a Professor of one of our Universities, on visiting the place with me a few years back, expresses most justly the character of the air; "Where have you brought me?" he emphatically said; "I am surely no longer in the Isle of Wight, these are the mountain breezes of the north!"

As a summer residence this spot cannot be too highly praised; and, to those who may be induced to come for the benefit of the chalybeate, the bracing character of the atmosphere adds, no doubt, greatly to the successful results so frequently obtained from its use. Unfortunately, the accommodation is very limited, and hence the use of a medicinal spring, which rivals, in general properties, the most celebrated in Britain, can at present be available but to few. It is hoped, however, some one may be found whose time, talents, and means would enable him to make this spring more generally a source of benefit to his fellow-creatures, and of pecuniary advantage to himself.

About eight years since, at a short distance to the westward beyond the cottage at the Chalybeate, the

main road sunk to the extent of some hundred yards, and, in some places, to a depth of about six feet; it is singular that this subsidence should have been synchronous with the landslip at Lyme, in Dorsetshire; that any connection can have existed between the two it would be preposterous to suppose, but the fact is remarkable.

This sinking of the road was, no doubt, the result of the land springs, which were then at a great height, washing away the softer stratum of green sand; the land around has since been well drained, and no further disturbance has occurred.

From about this point of the road, the Needle Rocks form a beautiful object in the distance, and, in favourable weather, the Island of Purbeck and St. Alban's or St. Andhelm's Head, are plainly visible in the horizon to the westward.

A short distance further on brings us to the Preventive Station, on the right, and to the Black Gang Hotel, on the left hand; and, after passing the latter, we arrive at a little cottage, converted into a sort of bazaar, through which lies the path leading down the Chine. A long building on the right hand, situated on the premises, contains the skeleton of a whale which was cast on shore in a dying state, near the Needles, four or five years since. The proprietor of this little bazaar and exhibition rents the Chine, and, although no charge is made to visitors for the privilege of using the pathway, which is renewed every year

at no little cost, owing to the frequent falling of the rock in the winter season, yet they are generally expected to make some trifling purchase on their return.

The descent to the beach is easy, owing to the pathway just mentioned, which has steps secured by wooden planks, and side ropes at the steeper parts. About midway the road from "Southlands" to Chale is crossed, and the level ground at this point affords a welcome resting-place in returning, and also enables the geologist to examine the strata in the most favourable manner.

During fine weather, the general aspect of this singular chasm is grand and solemn. But it is not in a state of repose that this scene should be visited in order to realize it in all its terrific grandeur. It is when the spirit of the storm sweeps with desolating fury this rock-bound coast, and when the howlings of the tempest strive for mastery over the roar of the world of waters beneath, that Black Gang Chine is exhibited in the character well qualified to earn its name.

Some little difficulty is generally experienced in descending at such seasons, owing to the violence of the current-wind which rushes up the opening; and, as rain is the usual accompaniment to such weather, it adds, by beating with violence in the face of the stranger, to the other disagreeables attending the visit. To a person accustomed to the stormy weather of Alpine travelling, these obstacles are trifling; but

those who fear exposure to the elements, such as has been described, must forego the pleasure of witnessing so magnificent a sight.

The sea, at these times, dashes on the beach with awful fury, and rushes occasionally even into the precincts of the Chine itself, to which, in ordinary periods, it hardly approaches within a hundred yards. On one such fearful occasion, the "Clarendon," West Indiaman, met her fate at this spot, and all her unhappy crew and passengers, with the exception of three, were in the short space of a few minutes dashed to pieces, and swallowed up in the whirl of waters.

The surf which beats on this coast in stormy weather very much reminds one of the Madras surf, and is as impracticable to boats as is its prototype; indeed it may be doubted if even the peculiar make of the Massoulah boat would save it from destruction when a fresh breeze from the south-west occurs.

It may be as well here to warn visitors against approaching too near the breaking waves even when only exhibiting their ordinary grandeur. After bursting, they rush up the beach to some distance, and the *back-draught* is so powerful as to throw down an individual who may be taken by surprise, and whose footing upon the loose shingle is necessarily so uncertain as to render him but ill able to withstand its force. Should a wave overtake a person in this manner, during tempestuous weather, he would probably be drawn into the boiling surge, and almost certain destruction would be the result.

A providential escape occurred in the past summer (1848) to a lady resident near the spot. She was walking with a female friend along the shore, far removed, as they imagined, from the dangerous influence of the waves, when one, bursting with more than usual violence, dashed up to them, and bore away the lady, above alluded to, in its retiring surge. Her struggles to escape so horrible a death were not those of an unnerved person, but of one who could, even at such a moment, call all her faculties to her aid; her struggles for existence, however, were in vain, and certain death appeared before her. With equal heroism and judgment, her companion, instead of rushing immediately to her aid, and involving the loss of her own life, watched the opportunity of the return of a wave of less force than the others, ran to her assistance, and, by an almost superhuman effort, succeeded in rescuing her now almost lifeless friend, and in placing her in safety on the cliff above.

Persons who may thus be overtaken by the waves are not always so fortunate as the lady just mentioned, as the following anecdote will show. One Sunday morning, about five years since, some lads were engaged in picking up oranges which had been washed on shore from a wreck in the neighbourhood; and, while thus occupied, one of them, a fine young man about 19 years of age, was overtaken by a wave, carried out a short distance, and within ten minutes cast up at the feet of his horror-struck companions, a lifeless corpse!

The little stream which, in fine weather, falls as a

silver thread over the hollowed abyss, and disperses in a light shower ere it reaches the bottom, is in stormy weather entirely wanting, the force of the wind scattering its tiny waters on the very brink. Were this a stream of any considerable size, its presence during the tempest would add all that is now wanting to complete a picture of awful grandeur.

With Black Gang the description of the Undercliff terminates, and some apology may be necessary for having dwelt so long on minute details; but the object has been not only to give every information to the passing traveller, and to render its scenes familiar to the more permanent visitor, but to record subjects connected with its history which have not hitherto been noticed, and to snatch others from oblivion, which, in the great change that has recently taken place in the district and its inhabitants, would speedily be lost to memory.

CHAPTER III.

CLIMATE, ETC.

The study of the peculiar atmospheric changes to which the surface of our earth is liable forms that portion of natural philosophy which is embraced under the denomination of Meteorology, and perhaps there is no one branch in the wide range of science more complicated or less understood than this. The subject has engaged the attention of philosophers from very early ages, and, when we consider how nearly our health and general welfare are connected with the state of the weather and the locality in which we live, we shall scarcely feel inclined to question the assertion that "Man is by nature a meteorologist." The science is singularly that of observation, and there is hardly a study connected with natural phenomena which in itself presents a higher interest than that of climate.

It involves considerations the most weighty, not only as regards the different operations of agriculture, in themselves objects of national importance, but it is so closely connected with health and comfort, that every individual of the community must feel that the inquiry attaches most nearly to himself.

These remarks, although generally applicable

throughout our globe, are more peculiarly suitable to our own land, whose changeable skies and uncertain seasons render the weather the first subject of conversation with Englishmen. They rarely meet but "they are in haste to tell each other what each must already know, that it is hot or cold, bright or cloudy, windy or calm." This may, at first sight, appear ridiculous to those who inhabit countries accustomed to a certain regularity of seasons, yet with us it is not so: "In our island every man goes to sleep unable to guess whether he shall behold in the morning a bright or cloudy atmosphere; whether his rest shall be lulled by a shower or broken by a tempest."

The votaries of knowledge have been toiling age after age, from the time of Aristotle to the present day, in the investigation of the *causes* upon which these changes depend, and, though rapid strides have latterly been made in many important branches of science connected with them, still we are very far from having reduced the subject to any general laws, and one is almost led to doubt whether we have not wandered from the right path, and are pursuing a phantom which our most strenuous efforts can never enable us to overtake. True it is that modern art has placed in our hands many valuable instruments calculated to assist us in our researches after truth, yet these very auxiliaries but tend sometimes to confuse us*. How is it that

* Kamtz, in the introduction to his comprehensive work on Meteorology, translated by Walker, says very truly:—"Whoever has made observations for any period with meteorological

we find the barometer standing at a certain height, the thermometer registering a certain temperature, and our hygrometer denoting a certain amount of dryness; with a cloudless sky over our heads and a brilliant sun illumining it, our spirits light and our every muscle partaking of the general joyousness of nature; while at another period we shall have our instruments indicating precisely the same results with an overcast sky, a chilly feeling pervading the air, our spirits depressed, and our whole body disinclined to exertion? Surely some *subtile influence* rules our universe which, although perhaps partially known to us, is but little and very imperfectly understood.

Admitting thus the partial failure of all our best endeavours hitherto to ascertain the true causes which regulate the various conditions of our atmospheric ocean, we must be content to draw our conclusions from those means already in our possession, and leave

instruments, and has endeavoured to deduce from them any general laws, cannot have failed to find that the result to which he has arrived is in formal contradiction to the best established laws. Thus, in a general way, the thermometer falls when the barometer rises; but how often the contrary is observed! How are the anomalies to be explained? Must we say that Nature is capricious? Assuredly not; for these anomalies are due to the action of the very causes which give rise to the other phenomena. An isolated observer, however much he may be supposed to be endowed with perseverance and sagacity, could not possibly arrive at a plausible explanation. It is solely by comparing his observations with those that have been made at other points that a satisfactory result can be obtained."—*Kamtz' Meteorology*, p. 3.

to future investigators the results of our imperfect experience.

The general term Climate, taken in its present sense, signifies those various influences which affect the different conditions of the atmosphere, such as heat, moisture, geological structure, habitation, cultivation, &c.; but the great bases upon which climate is formed are, as Leslie remarks, and as might naturally be supposed, latitude and local elevation.

A reference to those Tables which have been compiled for the purpose of comparison will in a great measure bear out the correctness of the remark. This, as a general rule, is applicable to the whole surface of our globe; but there are many, and in some instances striking, exceptions to it, and Britain itself furnishes, in a variety of instances, a departure from this common order of things. I believe if we take the comparative Tables of Temperature which have been published for the purpose in one of our best works on Climate, and, commencing at the Land's End, follow the line of coast to the eastward, we shall find that, *cæteris paribus*, the temperature gradually diminishes as we proceed, and that the decrease corresponds, though in an uncertain ratio, with the difference of the latitude, and that, although some places in our course form prominent exceptions, yet, generally speaking, the rule is vindicated.

The laws by which the temperature of different portions of our globe are governed bear the impress of

that Infinite Wisdom which directs the working of the great machine of nature. The heat evolved during the freezing of the waters of the Arctic Ocean restores to a certain state that necessary condition of the atmosphere, without which no living being could exist during the winter in those regions of desolation. In the same manner, the caloric abstracted from the solar rays in the progress of thawing which takes place during an Arctic summer, when the sun is so long above the horizon, tempers the intensity of that heat which must otherwise necessarily be generated.

Of all the various conditions of the atmosphere, &c., which, conjoined, form, as we have before intimated, what is usually understood by Climate, the foremost place has always hitherto been assigned to Temperature as the most important.

That Heat exercises great influence in modifying the other elements which form in the aggregate this state cannot be denied; yet there are other agents of vast importance which require equally careful investigation before we decide how far they may not affect the constitution of climate in any given situation.

However, as Temperature has hitherto, by general consent, been deemed worthy the first place, and as each agent is so intimately connected in forming the interesting whole, it would perhaps appear affected to give another element the preference, and it is therefore proposed, in considering the Climate of the Undercliff, to take, first, the Temperature, next the Pressure

of the Atmosphere, then its Hygrometric Phenomena, and, lastly, the other various conditions which enter into the subject.

In this category is omitted that subtile agent which I have before partially alluded to, and which will, perhaps, eventually prove the most important, namely, *Electricity;* but our observations and means of ascertaining its influence on the general combination are too meagre to warrant more than a passing hint of our conviction that it exercises vast power, if not the greatest, not only on the animal economy but upon Climate itself.

Ten years have now passed by since I first commenced the attempt of forming a just estimate of a district whose salubrity is exceeded only by its beauty, and which for a long period has been equally attractive to the tourist and the valetudinarian. I entered upon the investigation with a firm purpose to do justice to a spot of which so much had been said, and at the same time equally determined not to deck it with meretricious colours, but to give, as far as my means would allow, a faithful account of the various properties of its climate, and to suffer no bias to influence me in ascribing to it qualities which might be in the least degree doubtful.

In connection with this remark, it may be borne in mind, that in the following results the temperature is, perhaps, estimated rather lower than its actual height, as, whenever the thermometers employed have registered half a degree higher, the round number below it

has been taken, partly with the view of preventing confusion in the calculation, and partly from an unwillingness to give an undue amount of temperature. It may also be remarked that, during the period of years through which the following observations have been conducted, *but one day has been omitted in the whole series,* and neither time, trouble, nor expense have been spared to insure accuracy.

Before entering upon the somewhat dry detail, it may not be amiss to consider the various sources from whence Heat is derived, and to show, as well as we are able, that the Undercliff possesses, in an eminent degree, many of those advantages which give it a superiority in winter as well as affect the temperature of the summer.

The great source from whence Temperature is derived is of course the direct influence of the luminous solar rays, yet no inconsiderable portion owes its origin to the dark heat which arises from terrestrial radiation. The other direct influences which may act upon Temperature give too inappreciable an amount of heat to affect the general warmth of any given place in our latitudes, and are therefore inapplicable to our present purpose.

1st. The *General Exposure* of the Undercliff being from S. by E. to S.S.E., gives the most favourable aspect for receiving, during the winter, the whole amount of the sun's rays from its rising to its setting; indeed, during this season, the sun may be said to be continually on the Undercliff during the day, and an indi-

vidual might witness its emerging from the eastern wave to its declining in the west without changing his position.

2nd. The *Inclination* of the land, gradually shelving as it does from a height, at places, of about three hundred feet down to the shore, has the effect of allowing the sun's rays to fall at a less oblique angle during the winter than they would upon a plane surface, and, consequently, favours the receipt of a greater amount of direct heat.

3rd. The *Reverberation of heat from naked Rocks* also materially influences the Climate of a place, and the rocky barrier which protects this district from the cold blasts of winter is eminently adapted, from its character and geological structure, to fulfil this condition.

4th. The *Protection afforded by its heights* against the pernicious effects of various winds has been mentioned, and the remarkable wall of rock by which the Undercliff is defended, and which forms so striking a feature, is so fully described in other chapters, and the tract is so well defined by its name, that further allusion to this advantage is unnecessary.

5th. The *heat absorbed* during the summer months by a soil such as the Undercliff possesses is of course considerable; and the radiation which takes place during the winter, when the dark rays of heat derived from the terrestrial surface are more powerful than the luminous solar rays, contributes not a little in elevating its winter temperature.

6th. The last source to which we shall allude, from whence this spot derives additional warmth in the winter, is the *proximity of the wide expanse of the British Channel.* The immediate neighbourhood of this mass of water, by its action on the various winds, both moderates the heat of summer, and tends to soften by its influence the rigours of the winter season.

I have not noticed the temperature derived from a collection of buildings forming a town, or from a neighbourhood becoming thickly inhabited, although these causes are in themselves sufficient to exert by no means an inappreciable influence. This may be instanced from the fact that London is some degrees warmer than its neighbourhood; and Dr. Davy has particularly pointed out the difference of temperature between Valetta, in the island of Malta, and its vicinity, from similar causes *.

The town of Ventnor is at the present time neither sufficiently extensive, nor the population sufficiently large, to make these circumstances of any importance.

A long series of observations, carefully made with good thermometrical instruments, is absolutely necessary to determine, and is the only source from which a correct judgment can be made, of the true temperature of any climate. How little *mere sensation* is to be depended upon in estimating, with anything like correctness, real temperature, may be readily exemplified by the old experiment of placing the hand in a basin

* Dr. Davy's Ionian Islands, vol. i. p. 258.

containing hot water, and then immersing it in one in which it is merely warm: the effect will be to make the warm water feel cold. But to illustrate the fallacy of judging of temperature by personal sensation alone still further, and more aptly to our purpose, I may allude to a fact related by a friend of extensive acquirements, and a close observer. He was residing in one of the West India islands, and had been dining at the house of a friend at some distance from his residence; on his being about to return home, he found his horse, which had been standing at the gate for some time, trembling, and evidently so from the effects of cold. This he himself felt so much during his night drive, that, as he expressed himself, his "teeth absolutely chattered:" on his arrival at home, he naturally consulted his thermometer, and, to his surprise, found the mercury standing at 80° Fahrenheit!

That sensation is no better guide in a cold climate than in a hot one may be seen by the following passage from Sir James Clark Ross's very interesting voyage to the Southern and Antarctic Regions. On the 6th of March, being in latitude 64° 51′ S., he says, "The temperature of the air, having risen *to* 31° (Fahr.), *felt quite warm to us. It was indeed a perfect Mediterranean day!*" It would be difficult to persuade the casual observer, who rushes through a country and proclaims each place he visits hot or cold as he from various causes feels it, to believe that a temperature of one degree below the freezing point can ever feel "*quite warm;*" or that his "teeth would

chatter" while breathing an atmosphere heated to 80° of Fahrenheit.

This feeling of cold or warmth is by no means dependent on the absolute temperature at the time, but refers to the relative temperature which has preceded it. Thus, from the rapid radiation which takes place in the calm of a tropical night, the temperature is so quickly reduced, that not only are we conscious of it to a degree which causes positive discomfort, but dew is even deposited at temperatures which are generally sufficient to hold it suspended in a state of vapour. The negro of some of the West India islands is so sensitive of this change, that he has adopted what may at first sight appear to the European a ridiculous custom, but which is perfectly philosophical, namely, that of holding an umbrella over his head when venturing out at night, and thus preventing the radiated heat from escaping into space.

MEAN TEMPERATURE.

With the foregoing preliminary remarks we shall conclude our observations on temperature in general, and shall now proceed to consider the mean temperature of the Undercliff. The mean annual temperature for ten years of perfect observations (that is with the omission of only *one* day) is given in the accompanying Table.

Mean.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.
51·72	50·85	50·56	50·43	52·01	52·14	51·65	51·01	54·03	52·25	52·29

A remarkable agreement occurs in comparing the

observations on the temperature of springs of water in the Undercliff taken by my friend Dr. Bromfield and the mean of the above Table. The result of fifteen observations on a spring at Bonchurch, taken at different seasons of the year from 1843 to 1846, gives a mean of 51°·65; while that of the observations in the Table is 51°·72, exhibiting a *difference of only* $\frac{7}{100}$ *of a degree*. It may, however, be remarked, that the result of a somewhat similar set of observations taken at a spring at St. Lawrence, by the same accurate observer during the same period, gives a higher temperature, the mean being 51°·92, or, in round numbers, exceeding that of Bonchurch by a quarter of a degree. In speaking of these observations, it is also remarkable, that the extreme difference between the highest temperature observed and the lowest corresponds to a fraction, not only in the observations taken from these springs, but also from those registered by Dr. Bromfield at the deep well at Carisbrook*, the extreme range of temperature of each being 1°·75. The annexed Table will show this striking coincidence.

Places.	Highest temperature observed.	Lowest temperature observed.	Extreme range
Carisbrook .	52·25	50·50	1·75
St. Lawrence	52·75	51·00	1·75
Bonchurch .	52·50	50·75	1·75

* This well, from its depth, central position, and great

All these springs vary very little in their indications throughout the year, and this equality renders them well fitted for a standard of comparison with atmospheric observations on temperature conducted through a series of years, and I cannot but hope that the collateral evidence of the uniformity in their results with my own bears strongly on the accuracy of the latter. It must be remembered, in estimating the value of springs for meteorological purposes, that they differ in temperature with the depth of their reservoirs. Some are very constant, and the celebrated spring at Vaucluse, in Dauphiny, is said to vary not more than *one-tenth* of a degree through all the seasons of the year*. Springs which are found at great heights are usually of a low temperature. Those travellers who have toiled up the mountain side of Snowdon from Llanberris may perhaps recollect the icy coldness of a crystal spring at no great distance from its summit, as tempting to the parched lips of the thirsty traveller as its imprudent use under such circumstances is dangerous.

The extreme difference between the highest mean annual temperature, and the lowest in the table of mean annual temperature, will be seen to be only 3°·60′; yet this is a far greater range than usually occurs, and

uniformity of temperature, Dr. Bromfield regards as giving the mean heat of the interior of the earth, for the island generally, with a very near approach to accuracy. The total depth is about 290 feet, and the well ordinarily contains about 90 feet of water.

* Leslie's Treatise on Natural and Chemical Philosophy, p. 270.

arises from the very hot season of 1846. If we take the highest annual temperature next in the scale, and compare it with the lowest, we shall find the variation is very much less, and does not exceed 1°·82. In comparing the extreme range of mean annual temperature given by Dr. Shapter, in a series of ten years, we shall find that the Undercliff exhibits a superiority in its equability in this respect. The greatest range in the reports given by him in his "Climate of Devon," in the ten years of mean annual temperature, amounts to 5°·01, the difference occurring between the warm year of 1826 and the cold one of 1829; while that of the Undercliff arises from the comparison of the cold year of 1841 with that of the hot year of 1846, and amounts only to 3°·60, as has been before stated. The accompanying Table will show the range of temperature in each successive year:—

1839 and 1840.	1840 and 1841.	1841 and 1842.	1842 and 1843.	1843 and 1844.	1844 and 1845.	1845 and 1846.	1846 and 1847.	1847 and 1848.
0·29	0·13	1·58	0·13	0·49	0·64	3·02	1·78	00·4

The observations we possess for Torquay are hardly applicable for comparison in this place. It seems undesirable to admit for comparison a period of less than ten years' observations, and those I possess for Torquay hardly exceed one-half of that space. Independently of this, the observations, being kept in a dissimilar manner, offer no fair means of estimating

the difference, the results at Torquay being derived from an instrument hung six inches from a window on the first story of a dwelling-house, and, consequently, giving greater equability of temperature generally: neither rising so high in summer, nor falling so low in winter, as observations of my own, made in a similar manner, abundantly show. The instruments from which the results in the text are derived were placed in an observatory made specially to guard, as far as possible, from every kind of fallacy, and described in the Preface.

The mean temperature of the seasons, as deduced from observations for ten years, gives the following results:—

Winter.	Spring.	Summer.	Autumn.
41·80	49·82	61·31	53·95

The difference between winter and spring being 8°·02; that between spring and summer, 11°·49; between summer and autumn, 7°·36; and between autumn and winter, 12°·15. The extreme range of mean temperature, between the warmest and coldest seasons, will be seen to be 19°·51.

MEAN TEMPERATURE OF MONTHS.

Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
41·25	41·12	44·50	49·76	55·22	60·12	61·36	62·47	59·83	53·55	48·47	43·03

The above Table is the summary of ten years' observations.

It will be seen that February is the coldest month in the year, and August the warmest, the extreme range of mean temperature between them being only 21°·35. London exhibits a difference of above 26°·50; while that of the surrounding country exceeds this by 2°·50*. Dr. Shapter gives the climate of Devonshire (Exeter) as varying 24°·57 between the mean temperature of its warmest and coldest months.

EXTREMES OF TEMPERATURE.

The range between the extremes of temperature during the year, in ten years' observations, gives also favourable evidence of the general equability of the Undercliff. The highest temperature which has been registered during this period occurred during the hot August of 1842. On the 16th of that month, the thermometer in the shade, facing the north, indicated 88°. The barometer stood at 30°·8, at which point it had been stationary since the preceding afternoon, and so continued until the 17th. The hygrometer denoted 19° of dryness. Light breezes from E. to E.S.E. prevailed, and the day and night were hot and sultry, the temperature not sinking below 69°.

The extreme lowest temperature occurred on the

* Luke Howard, vol. i. p. 11.

night of the 3rd of February, 1841, when the thermometer fell to 20°. The barometer stood at 29°·80, and sinking; the hygrometer showed only 4° of dryness; the wind was cold and piercing, from N.E. and E. to E.S.E., and there were continual falls of snow throughout. The frost commenced on the first of the month, and continued until the 11th, when the weather broke up, and no more frost occurred during the season. It will be seen, that the two extremes of temperature happened in consecutive years, 1841 and 1842, and that the extreme range amounts to 68°. Luke Howard, in his valuable work, gives the highest temperature occurring in a decade of years, in the neighbourhood of London*, as 96°, whilst the lowest observed temperature fell to *minus* 5°, the former on the 13th July, 1808, with the wind at S., and the latter during the nights 9th and 10th of February, 1816, with the wind at N.E. The extreme range shows a difference of 101°.

In the severe winter of 1813–14 the little lake at Bonchurch was frozen over for about a month; but, during a period of about half a century since its first formation, it has only been frozen over four or five times sufficiently hard to bear.

Dr. Shapter† relates, that in 1825 the thermometer, in the shade, reached 95°, the wind blowing from the

* Climate of London, vol. i. p. 18.

† Climate of Devon, p. 14.

eastward; and on the 25th of January, 1829, the temperature sank to 12°, with the wind from the north-east. This would give an extreme range of 83°.

The lowest temperature registered in the Undercliff, of which I have any accurate account, is 18°, to which point the thermometer sank on the night of the 3rd of February, 1830. It, of course, would be deviating from our plan of taking a series of ten years as a standard of comparison; yet, if we place this against our highest registered temperature, we shall find the extreme range only amounts to 70°, showing a vast superiority over the climate of London in the lesser extent of range, amounting to 31°, and by no means an inconsiderable one over that of Devon, being 13°.

The *mean* extreme ranges for the year, seasons, and different months, are as follows:—

MEAN EXTREME RANGES OF TEMPERATURE.

Year.	SEASONS.			
	Winter.	Spring.	Summer.	Autumn.
50·6	26·0	42·8	31·3	41·2

MONTHS.											
Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
23·8	25·5	30·6	34·0	31·5	29·1	25·9	29·3	30·0	28·3	25·4	24·8

As might naturally be expected, the extreme range of temperature varies least in the first month of winter,

and gradually increases up to April, when it again gradually declines till July; in the two following months the extreme variations show an increase, and it then again gradually decreases until the cycle is complete.

MEAN DAILY RANGE OF TEMPERATURE.

The mean daily range of temperature forms by no means an inconsiderable item in estimating the value of any particular climate, and it will be seen that the Undercliff possesses an equability of temperature which enables it to take a prominent station in the list not only of our British climates, but also among the more vaunted ones abroad.

Madeira has been usually considered as the type of an equable climate, and, when we reflect that the extreme difference between the mean daily ranges of *all* the months in the year amounts to only 2°·3, we shall fully concur in the justice of the remark. The Undercliff, however, presents a superiority even over Madeira in mean daily ranges of temperature, in certain months in the year, and (which is of no small importance in regard to its reputation as a place of winter resort) during the very season it is most desired.

The only British climates which are at all superior to the Undercliff in this attribute are the damp climates of Penzance and Cove. The accompanying Table will show the comparative equability of Madeira and the Undercliff:—

MEAN DAILY RANGE OF TEMPERATURE FOR MONTHS.

Months.	Undercliff.	Madeira.	Months.	Undercliff.	Madeira.
January	7·46	9·15	July	10·62	9·82
February ...	8·20	10·17	August	11·39	10·05
March	10·42	9·79	September ..	11·09	9·83
April	12·84	9·39	October	9·53	10·56
May	12·82	9·05	November...	7·78	10·76
June	11·90	8·73	December...	6·96	10·48

During the winter months the above shows a superiority even over Madeira, as regards the variation of mean daily temperature, in the following ratio:—in October the difference is 1°·03; in November it amounts to 2°·98; in December, the first month of winter, the mean daily range of temperature in the Undercliff varies less than that of the same month in Madeira by 3°·52 in January the mean daily range is less by 1°·69; and in February 1°·97 than it is in Madeira during the same months. But, if we compare the difference of the mean diurnal range with that of London for a similar series of years, we shall have another example of the greater equability of temperature which the Undercliff presents, and we will add Newport to show the difference which exists at so short a distance as ten miles from the spot we are describing.

MEAN DAILY RANGE OF TEMPERATURE.

Months.	Undercliff.	Newport.	London.	Mths.	Undercliff.	Newport.	London.
Jan.....	7·46	9·03	8·92	July..	10·62	17·41	17·66
Feb....	8·20	10·11	10·93	Aug..	11·39	18·33	17·29
March..	10·42	14·03	12·77	Sept..	11·09	15·91	16·99
April ..	12·84	19·56	15·95	Oct...	9·53	14·28	13·54
May ...	12·82	19·00	17·52	Nov..	7·78	10·91	10·73
June...	11·90	21·25	18·61	Dec..	6·96	8·50	8·76

A single glance at this Table will be sufficient to prove the superiority of the Undercliff with respect to the comparative equability of its climate.

December is the month in which the mean diurnal range is least in this district, yet this month in Madeira exhibits within a quarter of a degree as great a range as any of the whole year.

The greatest mean daily range occurs in the Undercliff in the spring months of April and May, when it amounts to about 12°·84, whilst the least daily range is exhibited during the months of December, January, and November, when it amounts respectively to 6°·96, 7°·46, and 7°·78.

The extreme range of the mean diurnal variation during the whole year is 5°·88. While at Penzance it amounts to 6°, and at Cove to 9°·20, showing that, although the ranges are less during some months of the year at those places, yet the Undercliff presents a superiority in mean annual uniformity of temperature.

THE SUCCESSIVE DAILY RANGE.

When we consider the comparatively small variations of daily temperature exhibited in the Undercliff, we shall be quite prepared to find how little is the amount of range for each succeeding day. In this respect this climate is not exceeded during the more uncertain months by even that of Penzance, as the following Table will show:—

MEAN SUCCESSIVE DAILY RANGE OF TEMPERATURE.

Months.	Undercliff.	Penzance.	London.	Mths.	Undercliff.	Penzance.	London.
Jan....	2·34	3·74	5·10	July..	1·88	1·46	3·50
Feb....	2·38	3·26	3·20	Aug..	2 34	1·27	3·20
March..	2·44	3·15	3·38	Sept..	2·33	2·55	3·50
April...	2·41	2·52	4·60	Oct....	2·20	3·02	4·30
May ...	2·23	2·09	3·80	Nov..	2·43	3·18	4·70
June ...	2·24	1·61	4·04	Dec. .	2·46	4·41	4·80

It will be seen that, during the first four months in the year, the Undercliff shows a superiority over Penzance, varying from 0°·11 to 1°·40; during May, June, July, and August, the variation of temperature for each succeeding day is in favour of Penzance, the range being from 0°·14 to 1°·07 less than in the Undercliff. This is precisely what might have been expected from the peculiarities of these periods of the year at each place, the cooler summer of Penzance affording less variation. After August the Undercliff again exhibits less difference on successive days, and in December the range is less by nearly 2° than at Penzance. London has been added to this comparative Table as forming a sort of standard; but a

superficial view will be quite sufficient to show that there is no occasion to analyse the results so closely as has been done with Penzance, the superiority of the Undercliff over it, in showing less successive daily variation of temperature, being too evident to require remark. The mean annual successive daily range amounts to only 2°·39, while that of Exeter amounts to 3°·3, and Penzance to 2°·68.

ATMOSPHERIC PRESSURE.

The ebb and flow of the atmospheric tide are by no means the least interesting portion in a series of inquiries into the climate of any place, and the results indicated by a well-conducted course of observations form a collateral proof of the accuracy of most of the other parts of a meteorological series. Much that was mere philosophic conjecture with respect to the cause of the oscillation of the mercurial column, when Leslie wrote, may now be considered sufficiently demonstrated to admit of its being adopted as forming the basis of general laws; we find as a general rule, that, the warmer any locality is, the barometer will show a lower range than that of a colder district at a similar elevation. To insure correctness in comparative observations, two things are necessary—firstly, the use of a good instrument, and, secondly, to note the latitude and ascertain the precise altitude at which the barometer is placed above the level of the sea.

Were each country to possess the same amount of heat and moisture as those surrounding it in the same

latitudes, one set of observations would give the atmospheric pressure for all; but, as countries vary in their different conditions according to their locality, and being as a general rule both warmer and moister as they may be placed near an expanse of water, the indications of the barometer are found to vary much according to situation.

The height of the barometer, therefore, it will be seen, varies with geographical position, and may generally be expected to take a higher range in the cool, dry air of an inland situation, and a lower one in a maritime position, or where the observations are made near a large lake.

In a treatise such as this, which is merely intended to illustrate the climate of a particular district, it will be sufficient to advert to the fact that, as a general rule, the thermometer rises as the barometer sinks, and *vice versâ*. For the explanation of this fact, we must leave the inquirer to consult those works on meteorology, which treat more particularly on the causes and effects of the various changes in the atmospheric ocean.

With respect to the different oscillations of the atmospheric wave, we may remark, that the latitude of London would give, according to Kamtz, a mean diurnal variation of about 0·0196 inches, and that of the Undercliff, being nearly a degree further to the south, presents a variation of about 0·0260 inches; but I regret to say that, however interesting it might have been, and much as I could have wished it, it has not

been in my power, for want of the time which would be necessary in making a set of observations for this especial object, to verify this result by my own experience.

The instrument employed in obtaining the following results, with the exception of the first two years, has been one of Newman's portable barometers with iron cistern, which my lamented friend, the late Mr. Roberton, kindly compared for me with the standard at the Royal Society. The series of observations extend through a period of ten years, from December, 1838, to December, 1848, as far as regards the mean pressure and range for months, seasons, and years. The mean daily range, however, only comprises the result of observations from January, 1841, to December, 1848. The height of the barometer above the level of the sea, at high water at spring-tides, was ascertained, by actual admeasurement, to be 150 feet, and the hours of observation were 9 A.M. and 6 P.M. During the whole of this period, but ONE day is wanting of the morning observations, and very few of the evening. It should be added, that the barometric results are calculated without correction for capillarity or temperature, as I believed that they would form a better comparison with the observations of the majority of observers if inserted as read off.

The following table gives the mean annual pressure of the atmosphere in the Undercliff for a decade of years :—

1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.
29·74	29·83	29·70	29·82	29·85	29·84	29·83	29·82	29·87	29·80

The next Table shows the mean annual pressure for Exeter for ten years*:—

1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
30·05	29·86	29·80	29·97	29·75	29·68	29·77	29·85	29·72	29·85

Mean annual pressure for London for ten years, at a height of about 109 feet above the mean sea level†:—

1807.	1808.	1809.	1810.	1811.	1812.	1813.	1814.	1815.	1816.
29·82	29·87	29·79	29·84	29·84	29·84	29·87	29·79	29·80	29·77

The mean height of the barometer for the Undercliff in this series will be 29·81, while that of London is 29·82, and for Exeter 29·83‡. The comparative lowness of the pressure in this district may arise from two causes, viz., the elevation of the instrument, and

* Shapter's "Climate of Devon."

† Howard's "Climate of London."

‡ In Dr. Shapter's book, the mean height of the barometer is given as 29·87, but the result of the ten years' observations of mean pressure will be found to give 29·83, as above.

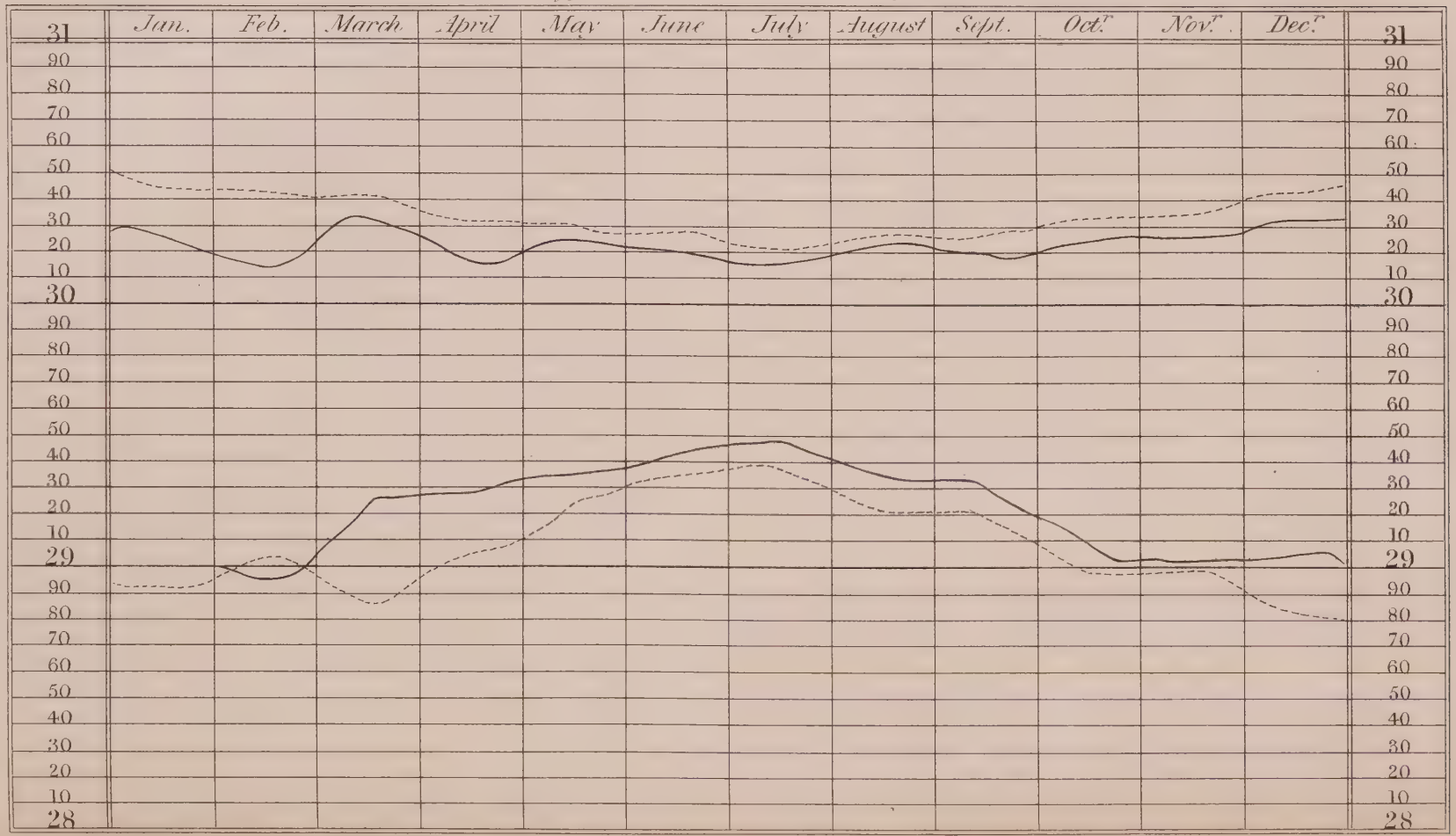
the difference of warmth of the places compared. In this comparison, however, as in all others, made at different places at a distance from each other, we must entertain definite conclusions with great caution; so much depends on the various instruments used, the method of observing, and the period of the observations. The following Table shows the mean pressure of each month for a series of ten years:—

Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
29·78	29·75	29·79	29·79	29·83	29·85	29·87	29·87	29·83	29·76	29.76	29·85

The mean height of the mercurial column, it will be seen, increases from February up to August, one being the coldest and the other the warmest month in the year.

The mean height of the barometer during December is remarkable, as it differs only 0·01 inch from that of August, which exhibits the highest pressure during the year. December is far from being, in general, a cold month with us, nor has it usually the gloomy skies so frequently attributed to it in England. Although the first month of winter, it has but few of its attributes; in the majority of seasons our parterres are still gay with flowers, our gardens not unfrequently show both strawberries, peas, and young potatoes, which have had no protection, and the honey bee may yet occasionally be seen pursuing its industrious labour. I make these remarks with a view of showing that, although as a

Mean Maximum and Mean Minimum Pressure for each Month in the Year, during a period of Ten Years; showing the curve of the Atmospheric Wave in the Undercliff and London in that period.



The plain lines relate to Undercliff; the dotted ones to London.

general rule the height of the barometer may form a rude guide as to the *temperature* of the atmosphere generally, yet various localities form exceptions.

The mean maximum height of the barometer during the period we have been considering is shown in the following Table, and London has been added by way of making the comparison interesting.

Months.	Undercliff.	London.	Months.	Undercliff.	London.
January ...	30·29	30·51	July	30·21	30·21
February ...	30·15	30·45	August	30·20	30·26
March	30·33	30·41	September ..	30·21	30·29
April	30·16	30·33	October.....	30·25	30·34
May	30·24	30·30	November...	30·28	30·37
June.....	30·20	30·28	December ...	30·30	30·44

The next Table gives the mean minimum pressure for the same time and the same places.

Months.	Undercliff.	London.	Months.	Undercliff	London.
January ...	29·00	28·93	July	29·44	29·37
February ...	28·96	29·02	August	29·40	29·23
March	29·23	28·89	September ..	29·31	29·20
April	29·25	29·04	October.....	29·10	29·00
May	29·32	29·26	November...	29·02	28·97
June.....	29·42	29·33	December ...	29·06	28·82

The opposite diagram shows the curves of the mean maxima and minima for the Undercliff and London, in accordance with the foregoing tables, and their striking agreement is highly interesting. In the London ob-

servations the lines gradually converge till the seventh or hottest month, when they diverge up to January or the coldest month. In the Undercliff the same results appear in the coldest month, namely, February, but the greatest convergence takes place in July, which is not so hot a month in the Undercliff as August.

The extreme annual range of the barometer for a decade of years is shown in the following Table, and a Table for London for a similar number of years has been added, by way of comparison.

Place.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.
Undercliff..	1·40	1·98	1·49	1·57	2·07	1·67	1·62	1·99	1·74	1·93

Place.	1807.	1808.	1809.	1810.	1811.	1812.	1813.	1814.	1815.	1816.
London	1·92	1·99	2·24	2·01	1·96	1·98	1·86	2·20	1·73	2·09

From these Tables it would appear that the barometer varies less, in general, in the Undercliff than in London*.

Dr. Shapter, in his "Climate of Devon," gives the following as the *mean yearly variation*:—

Place.	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
Exeter	1·80	1·33	1·60	1·85	1·50	1·76	1·55	1·30	1·65	1·56

* Luke Howard's "Climate of London," vol. i. p. 61.

And the annexed Table exhibits the *mean yearly variation* for the Undercliff.

Place.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.
Undercliff..	0·94	1·07	1·06	1·04	0·96	1·00	1·05	1·12	0·98	1·07

From this it would appear that the *mean* range is less during the year in the Undercliff than at Exeter; but from the following Table, extracted from Dr. Shapter's excellent little book, the *mean monthly* oscillation of the barometer is less on the average at Exeter than in this district. This Table also includes London, as Dr. Shapter has subjoined it to the results he gives.

Months.	Undercliff.	Exeter.	London.	Months.	Undercliff.	Exeter.	London.
Jan....	1·29	1·20	1·42	July ..	0·77	0 73	0·69
Feb....	1·19	1·08	1·35	August.	0·80	0·88	0·75
March..	1·10	1·11	1·29	Sept. ..	0·90	1·01	0·89
April ..	0·91	1·11	1·07	Oct....	1·05	0·98	1·15
May ..	0 92	0·78	0·91	Nov. ..	1·26	1·11	1·45
June ..	0·78	0·66	0·83	Dec. ..	1·24	1·15	1·45

The maximum height of the barometer during the series of years in which these observations for the Undercliff have been made was 30·56 inches, which point it reached in January, 1846. The extreme minimum during the same period was 28·40 inches, to which the mercury fell in January, 1843, during a very heavy gale of wind. The extreme range for the decade will, therefore, be 2·16 inches, while that of London * in a similar number of years, is 2·40 inches.

* Luke Howard's "Climate of London," vol. i. p. 61.

The mean diurnal variation of the barometer in the Undercliff, from 1839 to 1848, is exhibited in the annexed Table.

Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
0·088	0·087	0·067	0·051	0·053	0·057	0·055	0·045	0·056	0·073	0·054	0·054

The mean daily range for the year will be 0·063; for winter, 0·076; for spring, 0·057; for summer, 0·052; and for autumn, 0·061.

With this notice the remarks on the atmospheric pressure in the Undercliff conclude: they have been taken with unusual care; and, though the observations P.M. have not been noted at the precise hour recommended by the Committee of Physic of the Royal Society, namely, three o'clock, yet this has been a circumstance beyond my control, as there are but few days during the year in which other occupations do not demand my attention at that time.

HYGROMETRIC PHENOMENA.

We now enter upon the third section of our chapter on the climate of the Undercliff, and I feel the extreme difficulty of attempting to adduce anything approaching to a satisfactory comparison with other places in consequence of the diversity of the instruments employed, and the different periods of time at which the observations to which I have had access for the purpose of comparison have been made. The two hygro-

meters which have the greatest claim upon our attention, and which are most frequently used in this country, are those of Daniell and Mason. But both these instruments, excellent as they are, may lead to error, unless great care be taken by the observer. So satisfied am I that the first-named instrument requires some time before an individual attains sufficient expertness in making accurate observations with it, that I have felt myself compelled to expunge from my series (and thereby destroy in some measure its uniformity) the results of more than one year, from the conviction that I was not sufficiently habituated to its use to rely upon my observations during that time. I must add, however, that, the faculty of using it correctly once acquired, no instrument is so simple or so applicable to the purpose. The general fallacy which attends observations made by Daniell's hygrometer is, that the *ring of dew is allowed to be perfected* on the dark bulb before the temperature is noted, whereas it should be taken at the precise moment that dew is first seen to be deposited.

Could we always insure perfect calmness in the atmosphere, the wet and dry bulb thermometer (Mason's) would perhaps offer the readiest method of ascertaining the amount of moisture; but any motion of the air favours, as is well known, more rapid evaporation, and hence the thermometer connected with the wet bulb sometimes indicates a lower temperature than the positive amount of humidity would warrant.

There can be no question but that horary observa-

tions afford the only certain method of obtaining correct results, but these can rarely be obtained.

Again, a number of excellent observations have been rendered unavailable for accurate comparison in consequence of their having been made at only one hour in the day. On referring to the horary observations made by Kamtz at Halle, we shall see how little a single observation is to be depended on as giving the mean humidity. From the Tables he has given us, we find that during January, February, October, November, and December, the mean humidity will be very nearly obtained by two observations made at 9 A.M. and 6 P.M.; in March the mean humidity is shown at 8 P.M.; in April, 9 P.M.: in May, 9 P.M.; in June, 8 P.M.; in July, 9 A.M.; in August, 9 P.M.; and in September, 8 P.M. On looking at these results, I consider myself fortunate in having adopted, in consequence of their convenience, those hours (9 A.M. and 6 P.M.) which seem to give the nearest approach to the mean during five months (and those the most important) out of the twelve.

The greatest humidity in the twenty-four hours is made apparent at the coldest period, and the least about the warmest, as might be expected, when we consider that temperature is so closely allied to the different hygrometric conditions of the atmosphere. It is well known that cold air is less capable of retaining moisture than warm; and hence apparently the greater amount of moisture deposited in winter than in summer. But we are not to conclude from this that a climate is really

more humid in winter, because a greater average amount of moisture is indicated by the hygrometer or rain gauge. The higher temperature of summer gives to the atmosphere a greater capacity for moisture, whilst the colder season of winter does not admit of its holding so large a quantity in solution; hence the seeming difference.

The atmosphere on the coast is usually supposed to be more humid than that inland, from the greater amount of vapour abstracted from the sea; but it does not necessarily follow that every marine climate is a damp one. With a dry and absorbent soil, and with good drainage, the amount of humidity is comparatively small. Not only does such a climate (of which the Undercliff may be cited as an example) derive positive advantage in its winter temperature from a marine air, but is benefited also in summer in an opposite direction. In winter the temperature of the air is increased by the caloric given out during the deposition of rain or dew, and still more of snow; and in summer, when evaporation is more active and the higher temperature admits more readily of moisture passing into an aeriform state, the heat absorbed in the latter process tends to render the marine summer comparatively cool.

The following Table gives the mean dew point for seven years, the observations from which the results are obtained being taken at 9 A.M. and 6 P.M.

MEAN DEW POINT FOR YEAR AND SEASONS.

Mean Annual Dew Point.	Winter.	Spring.	Summer.	Autumn.
46·28	37·28	43·41	56·07	48·35

MEAN DEW POINT FOR THE DIFFERENT MONTHS.

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
37·03	36·05	38·53	43·07	48·69	54·43	56·85	56·93	53·68	47·95	43·45	38·78

From what has been previously said, we might naturally suppose, from the connection between a low temperature and the deposition of moisture, that a certain relation would exist between the dew point and the minimum temperature, and the circumstance has been noticed by more than one observer. I am inclined to believe that the minimum temperature of the twenty-four hours, and the mean dew point derived from *two* observations taken at appropriate hours, approximate very closely. It is, however, not unworthy of notice that under certain conditions of the atmosphere the dew point is many degrees *higher* than the minimum temperature; and this especially happens when severe weather is about to break up. The reverse is frequently the case during severe cold, the hygrometer at such periods indicating a *lower* dew point than the minimum temperature. The direction of the wind also tends to vary the relation between the dew point and the lowest temperature, the hygrometer

showing a lower degree in northerly and north-easterly winds. From the interesting nature, however, of this seeming connection, I have been induced to insert two Tables, showing the comparative relation between the mean minimum temperature for seven years and the mean dew point for the same period. The first Table gives only one observation of the hygrometer, viz., 9 A.M.

TABLE I.

Months.	Mean Dew Point at 9 A.M.	Mean Minimum Temperature in the 24 hours.	Months.	Mean Dew Point at 9 A.M.	Mean Minimum Temperature in the 24 hours.
January..	35·78	37·95	July.....	56·69	56·34
February.	35·24	37·32	August...	56·85	57·05
March	37·60	39·70	Sept.....	53·73	54·63
April.....	42·63	43·84	October..	47·37	49·18
May	48·97	48·86	November	42·89	44·82
June.....	54·69	54·71	December	37·97	40·01

The second Table shows the results of two hygrometric observations (at 9 A.M. and 6 P.M.)

TABLE II.

Months.	Mean Dew Point for 9 A.M. and 6 P.M.	Mean Minimum Temperature in 24 hours.	Months.	Mean Dew Point for 9 A.M. and 6 P.M.	Mean Minimum Temperature in 24 hours.
January..	37·03	37·95	July	56·85	56·34
February.	36·05	37·32	August ...	56·93	57·05
March	38·53	39·70	Sept.....	53·68	54·63
April.....	43·07	43·84	October...	47·95	49·18
May	48·69	48·86	November	43·45	44·82
June.....	54·43	54·71	December	38·78	40·01

On comparing these two Tables together, that which is derived from the *two* daily observations will be found to vary but little from the mean minimum temperature, the greatest variation being in November, when it amounts to above a degree and a quarter; whereas the variation between the dew point, *taken only at* 9 A.M., and the minimum temperature, exhibits a variation in some months of above 2°. The subjoined comparative Table will place the difference of each in a more conspicuous view.

DIFFERENCE BETWEEN MEAN MINIMUM TEMPERATURE AND MEAN DEW POINT TAKEN AT DIFFERENT PERIODS.

Months.	Different Periods of Observation.		Months.	Different Periods of Observation.	
	9 A.M.	9 A.M. and 6 A.M.		9 A.M.	9 A.M. and 6 P.M.
	°	°		°	°
January.....	2·17	0·92	July	+0·35	+0·51
February ...	2·08	1·27	August.....	0·20	0·12
March.....	2·10	1·17	September..	0·90	0·95
April	1·21	0·77	October.....	1·81	1·23
May	+0·11	0·17	November...	1·93	1·37
June.....	0·02	0·28	December...	2·04	1·26

From this it will be seen that the dew point at 9 A.M. *exceeds* the minimum temperature in May and July (the mark + denoting difference in excess); while from the *double observation* the dew point exceeds the minimum temperature in July only. From what has been before said we might be quite prepared to expect

the results here given; and if, as has been supposed and as is most probable, a relation between the dew point and minimum temperature exists, the above will show that no accurate comparisons can be obtained from a single observation.

It may be further remarked that, if we analyse the variation between the mean dew point taken at 9 A.M. and 6 P.M., and that taken only at 9 A.M. on individual occasions, we shall find that the *single* observation is frequently 3°, occasionally nearly 4°, below the *double*. Now this fact is by no means unimportant when we come to draw our conclusions of the humidity of any particular climate from the difference between its mean temperature and mean dew point; the comparison in the instance of the single observation would make the climate appear drier than it really is; hence the importance of a double observation, and the inutility, for the purpose of comparison, of only a single one.

The following are the mean results for seven years of the difference between the mean temperature and mean dew point (the latter taken twice a day, 9 A.M. and 6 P.M.,) and may be said to represent the mean evaporation.

Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
4·56	5·31	6·98	6·97	6·37	6·57	5·42	5·93	6·96	6·36	5·23	4·73

In comparing this Table with a similar one containing the difference between the mean temperature and the mean dew point (taken once only in the day, at

9 A.M.), there is a considerable variation, the single morning observation usually showing a greater amount of dryness, and consequently proving that it does not represent the real humidity.

It will be seen, from the above Table, that the greatest humidity is indicated in January, the previous month exceeding it in dryness by 0·17 only.

March and April are the two driest months in the year; and the large difference between the mean temperature and mean dew point shown in September may be accounted for by the high temperature of that month in the Undercliff. July exhibits a less degree of evaporation than the months which immediately precede and follow it; and this accords with the fact of the range of daily temperature being less in it than in either June or August.

The accompanying Table, taken from Dr. Shapter's "Climate of Devon," gives the mean results between the mean temperature and mean dew point, at 9 A.M., of Exeter, for five years, as tending to show the mean evaporation of each month.

Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1·8	2·8	4·4	5·9	7·3	7·1	8·9	7·7	4·8	3 1	1·4	2·3

This is at variance with the results I have obtained, and certainly, as far as the Undercliff is concerned, does not show the driest months in the year, March and April being assuredly the months in which less humidity is apparent.

Evaporation takes place more rapidly, and to a greater extent, in proportion as the density of the air is diminished, and the well-known rapidity of this process, *in vacuo*, tends to confirm the remark. Wind also contributes to promote evaporation, by communicating heat, and carrying away the vapour that is formed. In perfectly still air there is scarcely any evaporation.

The mean daily range of the hygrometer, for seven years, is given in the annexed Table.

Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
2·67	2·85	2·34	2·76	2·40	2·81	2·11	2·25	2·23	2·47	2·80	3·32

This Table points out the variation which occurs between the two daily observations, and further impresses the necessity of noting the dew point at more than one period of the day. The difference it shows is important, amounting in December to above $3\frac{1}{4}^{\circ}$, while, if the extreme range on some particular days were taken, we should find the variation very considerable; and my observations, as far as I have been able to make them, quite agree with the remark made by Kamtz, that, in littoral situations, greater humidity is exhibited in the afternoon than occurs in more inland places at the same period of the day.

With these remarks we close the results of our hygrometric observations for the Undercliff; and, with regard to its dryness, we will not say more than that the principle of the hygroscope invented by De Saus-

sure, when applied here in its natural form, in the shape of *ladies' tresses*, will, generally speaking, advocate sufficiently its superiority over most marine climates of a similar character.

FALL OF RAIN.

The fall of rain in a district constitutes a very important feature in the history of its climate. It is natural to suppose that the neighbourhood of the sea, or the vicinity of a large expanse of fresh water, would, as a general rule, favour the descent of a larger quantity of rain. But various circumstances modify this effect; and the peculiar situation of the Undercliff furnishes an instance of position tending to diminish the usual amount of rain.

The high downs with which its rocky barrier to the north is capped attract the clouds in their neighbourhood, and, meeting with a cooler stratum of the atmosphere, favour the deposition of their contents.

The situation of the Undercliff, it must be remembered, differs considerably from a tract *surrounded* by high lands, and forming a valley. Its aspect is more that of a valley sheltered on one side only, and possessing nearly all the advantages of such a locality, without being subjected to its drawbacks. For instance, its free exposure to the sea-breezes prevents the accumulation of noxious vapours, or malarious miasmata, which is too frequently generated in the valleys of a hilly district, and which give rise to so much human suffering and disease.

It is interesting to witness, on some occasions, when the wind is northerly, the fringe of cloud hanging over the downs, at some height, and enveloping the country on the other side in dulness and gloom, and, perchance, mist, while the Undercliff is enjoying the bright rays of the noon-day sun. The fact is accounted for by the clouds meeting the warmer current of air arising from the reflected and radiated heat of the Undercliff, and passing into the aeriform state thus become dissipated.

The fall of rain for this district, given in the annexed Tables, is derived from very careful observations made during a decade of years from December, 1839, to December, 1848, with a pluviometer, made expressly by Newman, placed about 3 feet from the surface of the ground, at a height, by actual measurement, of 150 feet above the sea level at spring-tides. The amount fallen was drawn off every morning, and the situation of the instrument was so chosen as to preserve a constantly moist atmosphere, and thus prevent evaporation between the periods of observation from exercising any perceptible influence on the contents of the gauge.

ABSOLUTE FALL OF RAIN, IN INCHES, FOR EACH YEAR.

1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.
32·89	20·71	26·68	18·97	26·94	23·38	21·49	30·48	20·65	39·38

MEAN FALL OF RAIN FOR YEARS AND SEASONS.

Mean annual fall of rain.	Mean fall of rain for seasons.			
	Winter.	Spring.	Summer.	Autumn.
*25·94	6·61	4·48	5·67	9·18

MEAN MONTHLY FALL OF RAIN.

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
2·25	2·13	1·77	1·29	1·42	1·40	1·81	2·45	2·16	3·58	3·43	2·22

Taking the climate of London as a standard from whence to derive a comparison, I shall again quote the accurate tables of Luke Howard, and add Dr. Shapter's account of the fall of rain at Exeter, as being one of the best Tables for a proper term of years within my reach at the moment.

Place.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.
Undercliff..	32·89	20·71	26·68	18·97	26·94	23·38	21·49	30·48	20·65	39·38

Place.	1807.	1808.	1809.	1810.	1811.	1812.	1813.	1814.	1815.	1816.
London....	18·01	23·52	24·18	27·51	24·64	27·34	23·56	26·07	21·20	32·37

Place.	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
Exeter	28·72	30·53	33·23	40·31	34·09	32·71	34·88	30·21	35·25	26·65

* The unprecedented quantity of rain which has fallen during the past year (1848) has much affected the average quantity.

Dr. Shapter, in his "Climate of Devon," gives the mean annual amount of rain as 31·90 inches; but, if the figures given in his Table of mean quantity of rain in each year, for ten years, be correct, we shall find the mean annual quantity is represented by 32·65 inches, giving a larger amount on the average than that which falls in the Undercliff of 6·71 inches, while the difference between the latter place and London (a proverbially dry climate) varies little more than an inch. The wettest months in the Undercliff are found to be October and November, though the former month is not so constantly a wet one as the latter. August comes next in the scale, and this excess of fall of rain may be explained by the variation which takes place in some seasons between the temperature of the day and night at this period of the year. April is our driest month, and, but for the unusual falls of rain which occurred during this month in 1846 and 1848, the average quantity would be much less than here represented. In 1840 no rain fell in April.

Rain sometimes falls in the Undercliff with tropical violence, and on the 23rd of August, 1843, 2·24 inches fell in the course of the twenty-four hours; the barometer stood at 29·60, the mean temperature was 59°·00, and the wind from the S.W. At Newport 2·80 inches of rain fell in the same time: this is the largest quantity registered during ten years.

I have observed a remarkable coincidence in connection with the height of the barometer and the fall of rain, which is, perhaps, not unworthy of notice

here. It would seem that, whenever the barometer falls between 29·60 and 29·45, we may almost calculate with certainty on rain during some period of the twenty-four hours; and, even when the mercury remains stationary between these two points, it is more than probable that a fall of rain, sometimes, indeed, only a slight shower, will take place.

This remark is further corroborated by a Table entitled, "Companion to the Barometer," constructed by Mr. Christensen, of Cowes, and deduced from a series of thirty-two years' observations of that instrument. I believe it was chiefly compiled for the use of mariners, but it is interesting to the meteorologist, as well as useful to the agriculturist. He gives the height of the instrument as varying from 29·48 to 29·62 when denoting "rain" or "change," according as the mercury may be falling or ascending, and according to the different seasons of the year. And his results agree very closely with my own observations*. The height of the barometer will, of course, vary with its elevation above the level of the sea.

More rain seems to fall during the night than in the day in the Undercliff, if we may judge from the difference between the number of days and nights on which

* The Table is published by Charles Wilson (late Norie and Co.), 157, Leadenhall Street, London, and has run through above ten editions. Another Table of this description, by John Underwood, has been published during the past year (1848) by Horne, Thornthwaite, and Wood, Philosophical Instrument Makers, Newgate Street, but he does not appear to have been aware of the existence of Christensen's Table.

rains falls. The mean amount for years and seasons is shown in the following Table, which is derived from ten years' observations.

Numbers of years.	Mean annual number.		Winter.		Spring.		Summer.		Autumn.	
	Days.	Nights.	Days.	Nights.	Days.	Nights.	Days.	Nights.	Days.	Nights.
1839 to 1848.	70·3	77·9	19·2	19·4	17·5	15·6	14·5	18·4	19·1	24·5

The number of nights on which rain falls, as compared with the number of days, appears to vary according to the seasons. In winter, the balance is nearly even; in spring, the days *exceed* the number of nights on the average by about *two in thirty-three;* while again, in summer, the nights give an excess over the days of *four out of thirty-three;* and in the autumn, the proportion amounts to *above five in forty-three.* Now, although the number of nights on which rain falls is positively greater during the autumn, it is not relatively so: the summer gives the larger number in comparison with the whole amount of days and nights. This is particularly exemplified in hot seasons, of which the summer of 1846 is a striking example. Rain fell on one day only in June, but on five nights. In July, it fell on three days and twelve nights; and in August, on five days and eleven nights. This result is what might have been expected from the laws by which the fall of rain appears to be governed.

The result of my observations leads me to believe that, as a general rule, a humid condition of the atmosphere does not depend on the amount of rain which falls, but that the relation between the hygrometer and fall of rain gives very opposite indications in some seasons. This is not, however, always the case, as May (usually a dry month), 1843, exhibited a very large amount of rain with a high dew point and small evaporation.

Dew sometimes falls heavily during the nights of summer; and on August 25th, 1840, so much fell as to leave an appreciable quantity in the rain gauge. The weather was beautiful, the barometer 29°·90, the hygrometer denoting 9° of dryness, and the wind from the W.S.W.; but the temperature fell lower during the night than on many preceding nights, and the moisture deposited registered ·01 inch.

Snow does not often fall in the Undercliff, nor does it usually remain long on the ground, and the amount is rarely great. On December 18th, 1841, a heavy fall took place, which gradually disappeared on the 19th, leaving hardly a vestige on the 20th; while on the latter day it was quite a foot in depth on the northern side of the hills out of the Undercliff, not a mile distant; and between Newport and Freshwater it was knee deep. The heaviest fall of snow I find recorded in my meteorological journals occurred on the 20th of March, 1846. It commenced about noon, and continued for three or four hours, the average depth being $5\frac{1}{2}$ inches; it measured in the rain gauge,

when melted, 0·46 inches, or in round numbers nearly half an inch; the barometer during this time stood at 29″·49. Mean temperature 37°; hygrometer at 9 A.M. 26°, at 6 P.M. 31°, and the wind from N.E. to N.N.E.

Hail is generally supposed to fall only during the day; but one of the exceptions to this rule occurred during the night of February 9th, 1848, when a storm of hail took place, accompanied by distant thunder, pointing out its connection with the electrical state of the atmosphere.

I have several times observed waterspouts over the sea, during my residence in the Undercliff, but on the 17th of August, 1845, one appeared to the westward, which equalled in size many that I had seen on the coast of South America; it was accompanied by others of smaller size. Its course was from the N.W., the direction from which the wind was blowing; but the intervening hills prevented me from observing whether it was connected with the sea. A report of this atmospheric phenomenon, however, appeared in one of the local papers at the time, in which it was stated that it was connected with the sea, as were also some of the smaller ones. The weather was bright and fair, the wind moderate, and no rain fell

The next subject connected with the climate of the Undercliff to which our attention is naturally drawn is the prevailing direction of the winds. These, as elsewhere, appear to be influenced more or less by the all-powerful agent of heat, and yet there is evidently a

close relation to their changes with the rise and fall of the barometer, and occasionally more so even than between it and the fall of rain. In confirmation of this remark, we not unfrequently find the barometer sinking without a fall of rain, or even strong wind; but it rarely happens, in such a case, that a change does not take place in the direction of the wind, and most frequently to a wet quarter. On the other hand, the barometer sometimes rises before rain, or even, indeed, while it is falling; but at these periods the wind will generally be found to blow from those quarters which are usually most free from humidity. Heat (or perhaps its equivalent, electricity) is, as I have before said, in all probability the moving power; but wind is the agent which carries out its manifestation.

Can the oscillations of the barometer in South America, which, according to Humboldt, occur with clock-like exactness, be influenced by the action of the different currents of wind which take place in those latitudes? This idea would appear to be rational, as these alternations of the atmospheric wave have been proved to disappear in the interior of large continents where the same effects of land and sea winds do not exist.

The general principle would seem to apply, in attributing the land and sea breezes which occur on our own coast to the same forces which create on a vast scale the trade winds. The atmosphere in the summer, in fine weather, being heated by the sun, gradually rises as the day advances, and the cooler current flowing in

to supply its place causes the sea breeze, which at such periods usually sets in, in the Undercliff, in May, June, and July, about 11 A.M. The cooler air of the evening, the atmosphere having lost the source from whence its heat was previously derived, gives rise to the land breeze, which comes from the land in consequence of the air being cooled by the rapid radiation of heat. During fine weather the wind usually falls in the Undercliff about 3 P.M. In connection with this variation of the wind may be mentioned the old remark of the boatmen residing on the island, that in settled weather "we can sail round the island with a fair wind" (provided, I should add, that there be enough of it); the cause will be obvious enough if we consider the effects above alluded to in conjunction with the position of the island.

The following Table gives the average prevailing winds for each month of the year during eight years, from observations taken three times a day.

TABLE I.

Months.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
January	2·87	5·12	3·37	2·75	2·50	6·37	3·75	4·25
February	3·00	3·75	4·50	2·50	2·00	5·50	3·75	3·25
March	1·62	5·25	6·12	1·37	1·87	8·37	4·25	2·12
April	1·75	5·25	8·75	1·25	2·00	6·00	3·25	1·75
May	1·62	5·25	6·62	2·37	2·62	7·75	3·12	1·62
June	1·25	3·25	6·50	0·62	1·37	11·25	3·50	2·22
July	0·87	3·50	2·87	1·25	3·50	10·62	6·37	2·00
August	1·50	3·62	2·62	0·37	1·25	12·50	5·00	4·12
September	1·87	6·12	7·00	1·50	1·87	6·12	4·00	1·50
October	2·62	4·00	4·00	1·12	2·25	8·25	5·50	3·37
November	2·62	4·75	2·87	2·25	2·87	8·12	4·50	2·00
December	2·87	4·75	5·12	1·50	2·62	6·12	5·25	2·75

The next Table gives the average prevailing winds for each season, deduced from the above.

TABLE II.

Seasons.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
Winter.....	8·74	13·62	12·99	6·75	7·12	17·99	12·75	10·25
Spring	4·99	15·75	21·49	4·99	6·49	22·12	10·62	5·49
Summer ...	3·62	10·37	11·99	2·24	6·12	34·37	14·87	8·34
Autumn ...	7·11	14·87	13·87	4·87	6·99	22·49	14·00	6·87

The third Table shows the relative proportion of prevailing winds during the year, for eight years.

TABLE III.

South-west	96·97 days.
East	60·34 „
North-east	54·61 „
West	52·24 „
North-west	30·95 „
South	26·72 „
North	24·46 „
South-east	18·85 „

From these Tables, which seem to me not the least interesting of the series, it will appear that the south-westerly winds predominate at all seasons of the year, in various proportions, exceeding the easterly even in spring. In winter, the southerly and westerly winds

predominate over those from the N. and E. by about six days on the average. In spring, the winds from the same quarters are nearly balanced. In summer, the northerly and easterly winds are exceeded by those from the opposite quarters by more than one-half, while in autumn the southerly and westerly winds preponderate over the N^{y}. and E^{y}. in the proportion of fifty-two to forty-one.

The only winds to which the Undercliff is directly exposed will be seen to be those of the least frequent occurrence, and those which blow from warm quarters predominate chiefly at the colder seasons of the year.

The subject of *Sea fogs* is that which next claims our attention, and it is one of great importance to a large class of invalids. My own experience, I must confess, of their effects on the susceptible mucous lining of the air passages of pulmonary invalids differs widely from that of some members of my profession, who believe them innocuous. I have found them very prejudicial, and especially when they occur in the colder months of the year. Those who have experienced the chilly sensation which is felt when passing through the dense canopy of a cloud-enveloped mountain will at once recognise that peculiar dry fog by which every point on the coast of Britain is occasionally visited. In fact, it is no more than cloud which has been formed at sea during the rapid evaporation effected by a bright sun and cloudless sky, and which infers, from the very fact of its existence and peculiarities, a colder stratum of air. It deposits no moisture,

which may be accounted for by the supposition that the various substances with which it comes in contact have at the time a higher temperature, and thus prevent any humidity from being lodged upon them. We must not confound this fog with those from whence Britain has derived its soubriquet of "Le pays de brouillards." The *mists* which prevail throughout England at certain periods of the year, and which among our countrymen obtain the name of "Scotch mists," are essentially different in this respect, that, although they give the sensation of chilliness to the body, they in reality part with much of their latent heat, and really tend to heighten the temperature of the surrounding stratum of air, through the cold effects of which it has been compelled to part with their moisture in minutely divided particles. The reeking coppice on a dull autumnal day gives us the idea of the *Moist fog or Mist*, whilst the dense, dry, *London fog* of a November day, apart from its most offensive and deleterious constituent of smoke, is no bad type of the sea fog of our coasts.

Fortunately, these fogs are far less prevalent in the Undercliff than on most parts of the British coast, and we may, perhaps, account for the fact by the existence of the valley which runs through the island, between the hilly ridges which bound its northern and southern shores. In this vale, and especially between Sandown and Newchurch marshes, sea fog is by no means so unusual as in our district; and the cause may be looked for in the constant current of wind which sets

from E. to W., or from W. to E., in that locality. The trees from Chale to Sandown bear impress of the influence of this current, and also of the greater force of the westerly breezes. When viewed from a height, the appearance of this fog is very interesting; the sun is, perhaps, shining brightly and warmly over head, while at our feet the dense mass of cloud—for such, as I have before said, in reality it is—rolls in a volume of suspended vapour, and we may frequently discern the top-gallant and royal masts and yards of vessels peering above the mass, while the lower masts, with their yards, and of course the hulls, are completely hidden from our view.

These fogs are principally met with during the last month of spring (May) and the first of summer, but they rarely continue beyond three or four hours, and are not sufficiently frequent to demand further notice in this chapter.

Before leaving the subject of mists and fogs, I may here allude to the occasional occurrence of a peculiar haze, which is of a transparent blue colour, and accompanied by more or less smell of burning peat.

The first phenomenon of this kind which I find specially noted in my journal occurred on the 28th April, 1840. The sky was unclouded, the weather sultry, the thermometer facing the north in the shade registered 74°; the barometer stood at 9 A.M. at 30°11, and the hygrometer indicated 15° of dryness. The wind was easterly throughout, and no rain had fallen for twenty-eight days previously. The horizon seemed

enveloped in a gauze-like blue haze, and the smell of burning peat was very powerful.

The next day on which it occurred to such an extent as to be worthy of note was on the 13th of June, 1845. The weather was very hot and sultry, and the thermometer to the north registered almost the highest temperature recorded in my journal, being 84°; the barometer stood at 9 A.M. at 30°·13, and at 6 P.M. at 30°·12; and the hygrometer gave 7° of dryness; the wind was from N. to E.N.E., and nearly calm; the sky was almost cloudless until 6 P.M., when it appeared to threaten a storm, but which passed off. No rain had fallen for four days previously. There was the same kind of haze and peaty smell as before mentioned.

But the most striking occurrence of this singular phenomenon happened on the 10th of May of the past year (1848). On my rising in the morning, shortly before 5 A.M., and before drawing up my window blinds, I was perfectly conscious of it, the smell of burning peat was so strong.

The sky was unclouded; the weather proved hot, but not unpleasantly so, the highest point registered by the thermometer to the north during the day being 74°. The barometer stood at 30°·17 at 9 A.M., and 30°·21 at 6 P.M.; the morning and evening observations on the hygrometer gave 15° of dryness each. The wind A.M. was E.S.E., veering to E. during the day, with a *moderate breeze*, while in the Solent, between Ryde and Portsmouth, it was *quite calm*, there not being sufficient

air to blow the pennant from the mast of a vessel lying at anchor at the Motherbank. There had been no rain for ten days previously. So pungent was the odour of the atmosphere, that it produced in me, when meeting the breeze, cough and sneezing. A steamer which passed the Undercliff within a league or two of the land, between 7 and 8 A.M., was but dimly seen, and its size seemed rather diminished than exaggerated, as is the case when the vesicles of fog produce by their magnifying qualities that appearance termed by seamen "looming large." In endeavouring to ascertain the height to which this singular appearance extended, I found, on reaching the upper part of the cliffs above Ventnor, that the atmosphere in the zenith possessed the usual diaphaneity observed in fine weather. On comparing the altitude to which the haze seemed to reach with the well-known height of St. Boniface Down, I am inclined to believe that it did not extend in a vertical direction above 1000 feet from the level of the sea. I had occasion to drive in the morning to Ryde, and took the inland road through Newchurch; the haze and its peculiar odour were equally pungent and perceptible throughout the whole way, with the exception of some woods a mile or two from Ryde, through which it seemed as if it had failed to penetrate. On my return in the evening, between 6 and 8 P.M., very little trace of it was apparent, and the sun set of a blood-red colour in a bed of haze. The sea, which had in the morning been, as it were, veiled in gauze, presented in the evening a well-defined

outline, and the moon, just then entering its second quarter, shone with its usual lustre; indeed, the atmosphere appeared unusually clear, and the stars glittered with tropical brilliancy.

The following day (May 11th), this phenomenon again occurred; the peaty smell was but slight during the morning, but increased in intensity during the day, and about midday the haze obscured distant objects; the sky was unclouded, and the thermometer rose to 72° in the shade; the barometer stood at 30°·25 in the morning, and at 30°·23 in the evening. The hygrometer showed 18° of dryness at 9 AM., and 16° at 6 P.M. The wind was from E.S.E. in the morning to N.E. in the afternoon, which seemed to drive the haze from the land, though the horizon at sea was obscured, as if it were still passing down Channel.

On the 12th and 13th, the two days immediately succeeding, the weather still continued cloudless, bright and warm; the barometer high, and the air dry, with the wind easterly, but *no haze or smell of burning peat occurred.* On the 14th, the haze and its accompanying odour was very slight in the morning, but gradually increased in intensity up to 6 P.M., when it was thicker, and its pungent odour more intense, than I had ever previously known it. The thermometer registered 73° to the north, the barometer 30°·05 A.M., and 30°·02 P.M.; the hygrometer, while exhibiting 18° of dryness at 9 A.M., indicated only 9° at 6 P.M. The wind was light and easterly, and the sky, unlike the

previous occasions on which I had noticed this phenomenon, exhibited some light cirri, with cumuli on the horizon to the S. at 7 P.M. A moderate breeze blew from off the land, and the haze was speedily dissipated. The next day was bright, beautiful, and calm, with falling barometer and dew point, but still an easterly wind and high temperature; and on the succeeding day the barometer and dew point fell, and the wind changed to S.W., and rain occurred after a dry period of nineteen days.

The subject appears to me to be one of peculiar interest. Whence comes this dry fog, or haze, or *smoke?* Kamtz notices it under the former denomination, and remarks, that it is common in the north and west of Germany, as well as in Holland. Finki attributes it to the *burning of peat*, which is turned up in autumn and burned in the month of May, if the weather be dry, in order to prepare the land for cultivation. Can the haze above referred to be wafted from the coast of Holland during the agricultural operations alluded to? The idea seems not improbable, when we consider the direction from whence it always comes. Certain it is that no burning turf or peat takes place on the coasts of Kent, Sussex, or Hampshire, in sufficient amount to cause the immense quantity of smoke which must necessarily be generated by the process to produce so extensive a haze, nor would the direction of the wind be favourable. A similar phenomenon takes places in North America; but the wind which wafts it to the coast is from the west, instead of the

east, as with us. It is there called "smoky weather," and is attributed to the burning prairies.

The electrical condition of the atmosphere is an important constituent in the various items which, taken together, form what is called climate. I have before alluded to my conviction, that it is on its influence atmospheric changes in a great measure, perhaps wholly, depend; and I regret that I am at present unable to demonstrate by actual facts that this conviction is well founded. Negative electricity is now known to be most prevalent during a humid state of atmosphere, and I believe the depressing agency of this particular kind of electricity exerts a great and prejudicial influence over the animal economy. Warm damp seasons are those in which the nervous system becomes most depressed, and disease is most rife; and the lassitude and indisposition to exertion which is felt in some situations, I have no doubt, depends on the electricity of the atmosphere being in a negative condition. On the south-western shores of Britain this is much felt; and I never visited the south coast of Devon (which I have frequently done at all seasons of the year) without experiencing this feeling in a distressing degree, and I am by no means singular in the observation.

I do not mention this as attempting to disparage one of the mildest, and, for a large class of invalids, one of the best climates we possess; but I believe the fact arises from the peculiar condition of the atmosphere, which, although not so humid as some other

parts of the county, is still far from being dry; and the sensations above referred to may, perhaps, be attributed to the electricity in its air being in the negative state.

The Undercliff is remarkably free from thunder storms, and no accident of any description has been known to occur in the district from these causes; while, in the immediate neighbourhood, the obelisk erected by Sir Richard Worsley, not more than one mile off, bears witness, in its ruins, to the power and ravages of the electric fluid. There is a peculiarity in the approach of a storm in this locality which deserves to be mentioned, and which is seen most strikingly when it rises in the south-west. On approaching the western end of the Undercliff, near Black Gang and Niton, its clouds divide into two portions, one of which takes the course of the valley of the Medina towards Newport, and the other, passing the Undercliff seaward, usually bursts upon the marshy tract between Sandown and Newchurch. I might cite a number of instances in which damage has been done, and even life lost, in the island and on the Solent, in the course of the last ten years, and, in many of these cases, the occurrence of the tempest has hardly been known in the Undercliff; but it will be sufficient for my purpose to relate an instance occurring during the past year (1848).

This took place in June, when a heavy storm of about two hours' continuance fell at Ryde, accompanied by torrents of rain, heavy thunder, and vivid

lightning; it was hardly felt at Ventnor, the part of the Undercliff nearest to Ryde. Two or three faint reflections of the flashes of lightning were alone seen, hardly a peal of thunder was sufficiently loud to attract attention, and only a very few drops of rain fell. The reflection of lightning, and sometimes the flash, is frequently seen at sea, and the distant muttering of the thunder heard, but the tempest itself rarely visits the Undercliff.

CHAPTER IV.

CLIMATE, WITH REFERENCE TO DISEASE.

THE southern part of the Isle of Wight,—the higher southern part (constituting the Undercliff), as it was sometimes called,—appears to have enjoyed a very high character for the salubrity of its climate from a very early date; and we meet with no description or history of the island in which reference is not made to this particular circumstance.

Before alluding to those diseases to which the climate of the Undercliff appears more particularly applicable in a sanative point of view, it may not be inapt to our purpose to take a general, but brief, survey of those maladies which occasionally occur in the neighbourhood. Although I have not had the advantage, in consequence of the absence of any public infirmary or hospital, of being enabled to draw up a statistical report of the general forms and amount of disease, still my close connection with the district has allowed of my forming by no means an incorrect inference on the subject.

Notwithstanding the sources to which I have just alluded, and from which alone a correct estimate of the

prevalence of particular diseases can be derived, have not been within my reach, yet I cannot but hope that the conclusions I have drawn from personal observation will be found closely to approximate to the truth; and I am warranted in believing them to be correct, from a consideration of the peculiarities of the district to which the last chapter refers.

As a general rule, marine climates, as well as those of the milder inland situations which are accounted favourable as winter residences to invalids labouring under pulmonary disease, present, at one period or other of the year, that state of atmosphere which, to the robust and healthy, gives the idea of relaxation and depression.

We usually find that, during the milder and more humid months of autumn and early winter, little severe sickness prevails among the resident inhabitants of such localities; while the dry bracing weather which commonly accompanies a fine spring not unfrequently originates acute pulmonary disorders, especially among the children of the poorer classes, exposed, as they naturally are, to its severity.

Disease, however, is rarely seen here in its acuter forms, the type it usually affects being of an adynamic character, but without running into that extreme stage which would mark it as typhus.

Not only do particular *seasons* exert their influence on disease, but the "*constitutio anni*," as Sydenham has well expressed it, exercises a most important influence in producing or favouring the extension of

those disorders by which they may be characterized. Blood-letting is but badly borne in this district; nor are the diseases of serous membranes, which more particularly indicate its use, of frequent occurrence. Far smaller doses of medicine are also requisite than in climates of a decidedly tonic character; and the *heroic* treatment here is much more likely to lead to disastrous results than the opposite, or "*laissez-faire*" system, though I am far from advocating such practice.

Fever, as an endemial disease, can hardly be said to exist in the Undercliff. Bonchurch is the only spot in which it might formerly be said to have prevailed; but it has ceased to show itself there, since the destruction of the bed of willows which used to grow upon the spot where the lake now is.

Intermittent fever was at one period likewise prevalent in the same lovely spot, but this has also disappeared with its malarious cause.

The Undercliff is now singularly free from ague; and, in the whole course of my practice, I have met with but two cases, neither of which, however, had their origin in its precincts. One was contracted while digging a deep drain in a swampy locality, and yielded readily to quinine; and the other was a long neglected case, imported from a distance, which, although at length subdued, left behind such organic lesions of important organs as ultimately destroyed life.

Several cases of eruptive fevers have fallen under

my notice, which have been so sensibly controlled with respect to their contagious nature, that it would appear some other power than the agency of mere precautionary measures exerted an influence in preventing their extension; and I cannot but believe this power exists in the peculiarity of situation, and the free ventilation which pervades the district.

Measles and Scarlatina have occasionally prevailed as epidemics, but not to any great extent; and the indisposition which there appears to be to their spreading here is both remarkable and interesting. The cases are usually of a very mild character. I may, however, remark, that the spring of 1841 formed an exception to the general mitigated form in which the eruptive fevers usually appear; and three or four fatal cases of a malignant kind occurred. I have also met with more than one case among the resident population, in which measles have affected the same individuals a second time, and with much severity.

Small-pox has occurred but twice, that I am aware of, during my residence in the Undercliff; one case of which was under my care, and proved a well-marked one of *variola confluens*, the subject of it being an adult about fifty-six years of age. Contrary to anticipation, perfect recovery took place, and no other instance occurred. The other case fell under the observation of a medical friend here, and also happened in an adult; perfect recovery also followed, nor did the disease spread among the numerous family of the patient, who resided under the same roof.

It is somewhat remarkable, however, that during a period when small-pox prevailed at Newport, and some other parts of the island, chicken, or swine-pox, was by no means of unfrequent occurrence here; but, although the premonitory fever in some instances was rather severe, little medical aid was required.

Rheumatism, especially in its acuter forms, is not common with us; but it is occasionally met with as a chronic disease among fishermen, or those whose avocations expose them to the influence of wet or cold.

Scrofula, although not remarkably frequent, is met with among the children of the lower orders; but when we reflect that smuggling, with its attendant vices, was at one period rife on our southern shores, we shall hardly feel surprised that this disease has been transmitted, as an inheritance, in the families of some of the former inhabitants.

Diseases of the nervous centres are by no means common; but I am inclined to believe that, where lesions of the cerebral system have been once established, the climate is not the most favourable to the patient.

Cardiac disease is not often met with among the inhabitants, and we may look for the cause of its infrequency to the comparative absence of acute rheumatism, and the greater abstinence from exciting liquors which is beginning to prevail among the lower classes.

Diseases of the lungs in a subacute form are sometimes prevalent among children, during the latter part

of winter and the months of spring, and death from these affections forms a considerable amount in the mortality which occurs in the district during that period. The possible cause I have already hinted at, and the amount of fatal cases is by no means formidable. Common catarrh, bronchitis, and bronchitis complicated with pneumonia, are the most frequent forms of disease.

Influenza appeared with us, during its fatal prevalence in the winter of 1847–48, only in its mildest form; indeed, I met with very few cases which assumed the more striking characteristics of the disease, and in none did it prove fatal. Catarrh accompanied by coryza was not uncommon, but its usual character was such as hardly to warrant its being classed as influenza. I should, however, remark, that in many instances the attack of influenza, even in this mild form, without doubt, favoured the production of phthisical symptoms in those already predisposed, and hastened the termination of some cases previously labouring under chronic pulmonary disease.

Asthma, as occurring among the resident population, is hardly known, and its effects on those who suffer from it, and who come here as visitors, vary, as might be supposed, as the case is adapted to pure fresh air or a dense confined atmosphere.

Croup occasionally occurs; but, although its symptoms are sometimes urgent, it rarely proves fatal.

Hooping cough is occasionally epidemic here as elsewhere; but during its visits there seems the same

indisposition to extend itself as has been noticed when speaking of eruptive fevers, and its character is usually mild.

Phthisis pulmonalis, or consumption, is sometimes met with among the inhabitants of the district, and when we consider the circumstances to which I have alluded under the head of scrofula, we shall not be surprised at its occurrence.

Pleuritis is not frequent, that is, it does not often assume that acute form which leads to effusion. Pleurodyne is not, however, so uncommon, but usually readily subsides by the employment of local sedatives.

Diarrhœa prevails at some seasons, and it sometimes attacks visitors in certain situations on their first arriving; it is in general easily controllable, and never gives cause for anxiety.

Peritonitis is occasionally, but far from frequently, met with, and demands the usual energetic treatment.

Dyspepsia, in various forms, is not unfrequent, and may arise, as in most other places, from the mode of living adopted by the poorer classes either from necessity or choice.

Diseases of the liver, involving organic changes, rarely occur, and functional disorder of this viscus is not more frequent than in other places of a similar character.

Diseases of the urinary organs are not common,

many of the causes on which they depend in larger communities being, generally speaking, absent.

I have met with two or three cases of puerperal fever in which it showed its usual malignity.

Affections of the thyroid gland are by no means frequent, nor would the situation of the locality lead us to look for their development.

Skin disease is not usual, although reports have reached me, far from creditable to the personal cleanliness of some among our poorer classes: did they but know how much their health depended on this important point, they would probably be less neglectful of themselves.

In taking this brief view of the various diseases which have fallen under my observation during my residence in this district, I have necessarily been obliged, in consequence of the smallness of the population, to draw my information from limited sources; but I believe the judgment I have formed will in general be found correct, and daily experience confirms me in the opinions I have advanced.

We have now to consider the Undercliff with reference to its advantages as a place of resort for invalids, and to mention some of the diseases for which its climate appears more peculiarly applicable. In doing this, it is not my intention to enter into the nature, symptoms, or particular treatment of each malady to which I may allude; for, however much the tenor of

such a book as this may be to point out to the physician and visitors the capabilities of the place and its peculiarities, in the alleviation or cure of disease; yet, to the physician, a medical disquisition would be superfluous, while to the invalid it might prove embarrassing and likely to lead to error. I shall, therefore, confine myself to merely naming those diseases which have appeared to me to derive benefit from the climate, and upon which the opportunities I have had for a number of years enable me to speak with confidence.

But, before entering upon the subject of the adaptation of this climate to particular diseases, it may be as well to point out some of the advantages which the situation of the Undercliff possesses for the invalid.

And, 1stly, I may allude to its beauty. To the individual oppressed and worn down by sickness, the cheerful aspect of the place of his retreat is by no means unimportant. The number of evergreens which flourish here, together with the luxuriant mantle of its ivy-crowned rocks, takes from the Undercliff, in a great measure, the dreary character of winter; while the highly romantic appearance of the district, the beauty of which has been so often and so fully descanted upon, adds not a little to amuse, as well as to soothe, the mind made irritable or enervated by disease.

2ndly. The Undercliff does not present the usual character of a contracted semicircle or basin which constitutes most frequently the characteristic of a winter-protected place. Nature has done for it, on a com-

paratively grand scale, what she has effected for others in a minor degree. In a *semicircle* some portion of it must be shut out from the cheering rays of the sun during a part of the day, which gives to it a gloomy feature; but where the protection extends, as it does here, to a distance of seven miles in a straight line, and which enjoys the whole warmth derived from the solar rays, the advantage of the situation cannot fail to be evident.

3rdly. In addition to the warmth communicated by the rays of the sun, it enjoys also the full influence of its light. If *light* be important to the healthy growth of vegetables (and without which they are unable to accomplish one of the great objects they are supposed to be called upon to perform), how much more essential must its presence be to the well-being of man, especially when worn down by suffering and disease! A plant confined in a darkened cellar becomes blanched, and no longer discharges those functions necessary to its normal condition. Its leaves, those vegetable lungs, no longer possess that power of decomposition which, while they render the atmosphere better adapted for the purposes of animal life, appropriate a portion of it to the healthy formation of their own proper juices, and thus fulfil an important part in the great scheme of nature. So man, deprived of the invigorating influence of light, decays: his body wastes, and his mental powers sucumb, and even the society of others of his kind, similarly situated, does not prevent the general depreciation of mental and physical power. If light

be thus required by man in his ordinary state, how essential must be the influence of this invaluable blessing when the body is debilitated by disease! Its effects are then positively tonic, and a place which, from its position, enjoys the full effects of solar light during the winter, possesses one of the foremost qualities necessary to a restorative climate.

4thly. The Undercliff possesses the advantage of all absence of mud at low water, as well as the non-existence of much that is offensive, both to sight and smell, in places where a tidal harbour exists. The numerous little bays and coves present, at ebb-tide, a beach of sand or fine shingle, which forms an excellent bottom for sea bathing when the tide serves. It is amidst the shingle just mentioned that the beautiful crystals are found which have obtained no little celebrity under the name of "Ventnor diamonds." They exhibit great brilliancy when cut and polished, and vie, in no slight degree, with some of the inferior gems of South America.

5thly. I have already mentioned, in a former chapter, the character of the soil and the inclination of the land towards the sea, circumstances highly favourable to the rapid drying of the ground after a fall of rain; and the recent establishment of public drains and sewers has not been without its effect in the further accomplishment of this object.

To the invalid this is a great advantage, as it enables him to take his exercise out of doors within a short time after rain has fallen; and there are few

days during the winter on which a visitor, unless *very* delicate, will find himself confined in doors by damp or rain. In confirmation of this I may mention the result of a diary kept by a friend and patient of mine a few years since: he found on leaving the place (in which he had resided from the latter end of September to the beginning of June) that there had been but *ten* days on which he had been unable to take his usual exercise in the open air, and on three of these he had not been prevented so much by the weather as by casual indisposition.

One great cause of the capability of the climate in allowing invalids to take exercise, even during comparatively rainy seasons, will be found, by reference to the preceding chapter, to arise from the fact of rain falling more frequently at night than during the day.

6thly. Situated as this district is, fully exposed to the ocean breezes, it is a matter of surprise that the trees, generally speaking, do not exhibit that "set," or lateral inclination, so generally remarkable on the sea coast. The reason may be looked for in the fact that, except at a few points, although free ventilation exists, there is *no draught of air;* and at these points the usual inclination will be observed. I may instance the belt of trees which forms the south-westerly protection to Old Park, and which show this "set" in consequence of the direct current or draught which exists between that point and the gully through which the road passes from St. Lawrence to Whitwell.

From there being few breaks of this kind in the cliffs which form our northern boundary, the same cause as that just mentioned does not generally exist, and we can easily conceive that a strong wind blowing upon a vertical surface may, as it were, become compressed, and thus present a resistance arising from its own force.

The upper terrace, in Steephill grounds, gives an apt illustration of this theory; it immediately adjoins the cliffs, and, although perfectly open to the sea-breezes, they are rarely felt with violence; and the luxuriant vegetation by which it is enriched, with figs and vines growing in a state of wildness, proves also its mildness and the general quiescence of the air, although situated between three and four hundred feet above the level of the sea.

7thly. The extent of ground for exercise forms a very prominent feature among the advantages afforded by the Undercliff.

To the invalid who is able to take exercise on horseback, or in an open carriage, the benefit derived from the protection of its rocky barrier for a distance of seven miles is obvious enough; and no place of winter resort, that I am acquainted with, offers a similar protected space.

This ride may be taken during the prevalence of northerly, north-easterly, and north-westerly winds; but should the wind blow from the E. or S.E., or with severity from the S.W., the invalid may then take his exercise towards Appuldurcombe and Wroxall, a dis-

tance of three miles, when he will have the high downs of Shanklin and Dunnose affording him protection from the east, while those skirting the western confines of Appuldurcombe Park, upon which stand the obelisk and semaphore, shelter him from the westerly breezes.

I have, of course, been alluding in the above passage to invalids whose strength and other circumstances fully admit of much exercise out of doors; but there are a large class who are hardly able to encounter even the little fatigue which these rides or drives necessarily involve. To them the road between Ventnor and Bank End Farm, or St. Lawrence, offers a sheltered and pleasant walk or ride; while to the still more delicate the level ground in front of the Marine Hotel, or the esplanade on the beach, which has just been completed, affords the warmest and most sheltered ground for daily exercise.

On fine mild days the cliff walks, both to the east and west of Ventnor, will be found pleasant as well as healthful; and in dry weather a stroll to the romantic village of Bonchurch offers a variety.

Independent of the advantages to which I have thus alluded, which the Undercliff presents, there still remains another to be mentioned, which it is important for invalids to bear in mind, namely, the *variety* of situation which it offers. To some a low and warm situation is more suitable, but others require a more bracing spot; both these are to be found in Ventnor and Bonchurch; while the clear down air of Black

Gang offers during the summer and earlier autumn months all the benefits to be derived from a fine pure tonic atmosphere.

It must be understood that, in making the above remarks, I have been referring more particularly to the advantages which the Undercliff possesses as a place of winter resort. During the latter part of summer and early autumn the district presents little superiority over most of our marine places of summer residence; but it then offers to the tourist, the artist, and the lover of scenery, one of the most delightful fields of enjoyment to be found in Britain, and a month or so may be then well and profitably spent, without meeting with that *torrid atmosphere* which has been erroneously ascribed to it at this season.

It is not to be denied that there are spots in the Undercliff where the mid-day sun, on a *calm* clear summer's day, is felt with almost tropical violence; but the air is usually tempered by a cool sea-breeze, and the effects just mentioned are confined principally to those places where the absence of trees or verdure offers no opposition to the reflection of the solar rays.

Having thus far considered the diseases most usually occurring in the Undercliff, and noticed some of the more prominent advantages which it possesses as a place of invalid resort, we have now to point out those conditions of the system as well as those diseases to which the climate appears more peculiarly suitable.

To persons who have been long resident in tropical countries, and especially children, the climate during the winter is particularly favourable. I have found a relaxed and an anæmic state of system generally rally here during the winter and first months of spring, but in ordinary seasons it will probably be necessary to remove to a more bracing atmosphere than that which sometimes prevails in April and May. Should, however, the season at that period prove fine and warm, Black Gang affords a most eligible retreat, and the use of its aluminous chalybeate spring, especially in cases complicated with certain forms of menorrhagia, enhances the value of its mimic mountain air.

While adverting to this medicinal water, I may mention that it does not appear to be so generally known to the profession or so justly estimated as its highly beneficial qualities deserve. Whether this may be owing in some measure to its having failed to exert the same power over disease at a distance, which it certainly possesses at its source, I am unable to say; but my own experience of its therapeutic qualities quite bears out all that Dr. Lempriere asserts in his valuable report on its effects, though I have never been able, but in one instance, to give it in the doses he mentions. This may probably arise from the fact, that the invalids in whose cases I have chiefly employed it have been females of a very delicate habit, and especially intolerant of medicine in general. I find it is best exhibited in soda water, commencing with about a dessert-spoonful as a dose three times daily, gradually

increased up to an ounce and a half; beyond which quantity, as has been just remarked, I have rarely found it agree; and in large doses its astringent properties interfere most inconveniently with its other effects.

It may not be out of place here to hint to the mere visitor, who in passing through the island visits this spring as a *curiosity*, that it is of a most powerful description, and that a large draught of it, which, notwithstanding its nauseous taste, is not unfrequently incautiously swallowed, has, on many occasions, been followed by disordered stomach and a smart febrile attack.

It is in those forms of constitutional disease which come under the category of Scrofulous or Tuberculous that the climate of the Undercliff appears peculiarly adapted. Its beneficial effects in cases of glandular enlargements, diseased joints, scrofulous wounds, necrosis, and lastly in phthisis, are witnessed in each returning season.

In a certain class of bronchitic affections also, and in those cases where the lung has been compressed by pleuritic effusion, the climate is highly favourable. But it is in the incipient state of phthisical disease that a residence in the Undercliff should be particularly sought; and, as a general rule, few cases of the kind occur which would not benefit as much by a resort to this romantic district during the months of winter and spring, as by encountering the journey to a foreign land, and being deprived of the comforts and conve-

niences so necessary to an invalid and so highly prized by Englishmen.

As a large number of cases among our winter residents have their origin in, or are dependent upon, a tuberculous diathesis, and are generally included under the head of pulmonary consumption, it may not be out of place to advert to the different phases of this insidious and fatal disease, in which I have found the climate advantageous.

I will first allude to that state in which there is simple hereditary predisposition, and in which the attention of friends rather than the individual himself is called to the seeming failing of health and strength without an obvious cause. This may be distinguished as the first, or stage of *threatening*, and is characterized by pallor, alternating with flushing of the countenance, cold extremities, occasional palpitation, some slight breathlessness on exertion, but no cough; various dyspeptic symptoms, the skin easily excited, a disinclination to exertion, and a general feeling of languor.

The stethoscope gives us here no particular signs, or at the best but uncertain indications: disease is only collecting its forces for the threatened invasion, and the symptoms probably depend more at this time upon imperfect circulation and nutrition. It is at this period, and let it be remarked this is perhaps the most important one, that a change to the climate of the Undercliff exerts the most favourable influence. A few months' residence here will probably restore to the system its

usual tone and vigour, and the individual will in a short time become impatient at the idea of being called an invalid; let him, however, remember "the snake is but scotched, not killed;" and that a return to his former habits and pursuits too soon will probably be followed by a recurrence of his former symptoms. He must rest contented to "lie fallow" as it were, and amuse himself with some of the more healthy studies and pursuits which the two succeeding chapters have been written to promote.

The second stage, or as it is most ordinarily called by medical authors, and perhaps with propriety, the *first*, may be described as that in which the enemy has organised his forces, and invasion has commenced. The symptoms mentioned in the preceding paragraph are aggravated, but perhaps only slightly so; the breathlessness has however become more marked, and an occasional hacking cough is superadded.

A slight streak of blood may also be occasionally seen in the mucus secretion which occurs in some cases in the morning, and which may perhaps pass unnoticed by the invalid; should he, however, observe it, the attention of his medical attendant should be drawn to the circumstance. The practised medical ear now at once recognises those stethoscopic signs which point out the real nature of the complaint; it is no "stomach cough!" The patient may now be said to be the subject of tuberculous disease, but in that form which, under proper management and a residence in a climate

such as the Undercliff, may even yet be arrested, and the invalid recover.

The third gradation is that in which tuberculous disease is formally established; the most prominent symptoms being a distressing cough and thickened expectoration, which varies, however, in intensity and quantity in different individuals; occasional hæmoptysis or spitting of blood occurs; frequent pseudo-inflammatory action is set up, from the irritation caused by the tuberculous infiltration: the stethoscope detects at once the progress of disease.

The symptoms which were mild before have now become more grave; the skin and bowels occasionally affect some of the functions of the now imperfectly acting lung; and profuse perspirations and diarrhœa occur; the strength decreases, and the emaciation progresses; and every symptom evinces a gradual decadence, to the last and fourth stage of this most insidious and dangerous of diseases. In this the symptoms are too readily recognisable to admit of a doubt as to the nature of the complaint, and the stethoscope is now only useful in pointing out its extent, and deducing from that the probable duration of life.

In the third stage in very many cases disease may be kept in abeyance, and life prolonged for an uncertain period by the removal to a suitable climate, and the observance of those strict precautions which the state of things demands, and any infringement of which may lead to a rapid and fatal termination. This stage is

one in which a change to a foreign climate is extremely hazardous; the benefit to be derived is doubtful in all cases, while in some every symptom is aggravated and new ones developed by the fatigue and occasional exposure incidental to the journey or voyage in the removal to a foreign land. If change of climate is deemed advisable in such cases, it should be in general to those places at home which offer all the modifications of an English winter and for which the Undercliff is remarkable.

In the last stage of this sad disease transportation abroad is a positive cruelty, and the poor sufferer should be dissuaded by every means in the power of relatives, or the medical attendant, from making the attempt. The self-delusion of ideal benefit will become apparent too late, and disease will in all probability be called into greater activity, and the fatal result be more rapid. *Home* under such circumstances is the proper place; but, should the wishes of the patient for change be predominant, let it rather be to one of the milder climates of his own land, where he may probably be allowed to enjoy life to its utmost limits better than in a colder situation; and where his removal home may be easily accomplished, or his friends may be more readily summoned to his dying bed, should so sad an occasion present itself.

It is not intended to assert that the most unpromising cases, even where a portion of the lung has been destroyed, do not occasionally rally, and the patient become comparatively well. Such instances

have come under my own observation here on more than one occasion; and I was once shown an official certificate from one of our highest medical authorities on the case of a young officer, which described him to be in the last and most hopeless state of phthisis, and from whose symptoms another opinion could hardly be formed. He was carried to his bed on his arrival here, and left the place in a few months, instead of needing support himself, with a relative on each arm!

But perhaps it may be said that the case was one of those fortuitous ones which are occasionally met with among a large number of the same description—granted; yet this is no solitary instance, and I could bring forward many others, were I inclined, to show that the beneficial effects of the climate of the Undercliff does not merely exist in the fevered imagination of the enthusiast, or in the interested calculations of the mere speculator. "The exception proves the rule;" and who shall say that any individual case may not prove that exception? and, as in the example of the young officer quoted above, too decided an opinion as to the fatal termination of *any* case, however much circumstances may warrant our conclusions, may prove sometimes not only detrimental, but highly injurious to the prospects of the sick person.

In some of the more unfavourable cases in which, with the fond clinging to existence which characterizes the disease, the sufferer craves for change with that longing desire which in one so situated hardly allows a denial, a removal from the cold situation of his own

home to the milder climate of the Undercliff will sometimes tend to prolong life for a short time, and lessen the sufferings produced by his malady. Instead of being confined to the atmosphere of two heated rooms, where he rather exists than lives, the invalid will frequently be enabled to enjoy the invigorating influence of the open air, or—and it is a matter of no small importance—he will find that he can bear the in-door temperature of this climate better than that of the one from which he has removed.

In the foregoing remarks on pulmonary affection I have not referred to the different varieties of phthisical disease, nor the peculiarities of individuals, in which the symptoms are more or less prominent, and in which the progress of the malady is more or less rapid. These considerations belong especially to the province of the physician; and the public in general, for whom these pages are more particularly written, would hardly be able to appreciate such distinctions, and might draw erroneous inferences from them.

I have hitherto been speaking principally of that form of disease arising from constitutional degeneracy, which, though too often popularly believed to be an affection of the lungs, is by no means confined to those important organs, although it more commonly shows itself in attacking them. To these cases change of climate is more eminently suitable; but there are others equally susceptible of improvement under its influence, which we shall now proceed to notice.

Bronchitic affections, especially those of a chronic

character, usually benefit here, and in some instances with surprising rapidity; but where there is extreme susceptibility of the bronchial membrane, a less tonic and more humid atmosphere may be desirable, and the air of Torquay be preferable.

Those cases where disorganization of the pulmonary tissue is threatened, subsequent to compression from pleuritic effusion, usually do well here; and some remarkable instances of recovery have fallen under my notice. The most extraordinary case of empyema, which I have ever witnessed, came under my observation here, in the person of a member of my profession. The operation of paracentesis thoracis was *performed by the patient himself,* in the presence of my lamented friend, the late Mr. Dodd (formerly surgeon to the Chichester Infirmary), my brother, and myself, and with complete success. The case is a most interesting one, and is related very fully by Dr. Hughes, in a paper read before the South London Medical Society, and reported in the Medical Gazette for February 5, 1847.

Persons who suffer from some forms of dyspepsia, especially from those which have been termed atonic and nervous, usually benefit by a residence here. In the gastritic or inflammatory kind, however, the invalid should leave the Undercliff before spring, and the change to Torquay for two or three months will be found more beneficial than a more prolonged residence in either place.

Those individuals of a gouty diathesis, who take up their abode here for a season, will find the attacks less

frequent and of a much milder character than in most other climates.

Rheumatic affections also derive benefit from a residence in this district; though it should be observed that the amount of good obtained depends very much, as it must always do in a British climate, on the particular character of the season.

It may be remarked that the peculiar torpid condition of the liver, which so commonly forms a cause of distress in a more humid and enervating climate, occurs but seldom in the Undercliff.

The qualities of the spring water I have sometimes found exercise a powerful influence on the urinary organs, and their effects have, in some instances, proved most beneficial in certain nephritic affections.

That peculiar disturbance of the vital functions, usually termed climacteric disease, is commonly checked under the influence of a change to this climate, and a state established which promises a healthy old age.

With these remarks I shall close my notice of the more prominent forms of disease, to the cure or alleviation of which the climate of the Undercliff is more particularly adapted; and I shall now proceed to consider some other circumstances connected more or less with the residence of invalids here during the colder seasons, as well as to make a few observations on some points tending to the comfort or welfare of patients seeking a retreat in our genial clime.

Notwithstanding the conflicting opinions regarding

the climate of the Undercliff given by its earlier invalid residents, it seems certain that in a great majority the result was the same; they almost invariably improved in health, even when complaining with the querulousness of sick persons of cold or humidity during an unfavourable season.

Invalids should be aware of one thing, they must not expect too much from the effects of climate alone. Climate is merely auxiliary to other means, and should only be regarded in that light. Sir James Clark's remarks upon this subject, in his work on the "Sanative Influence of Climate," are so admirable, that nothing I might urge could convey a better idea of the fallacy I am endeavouring to subvert, and little apology is therefore needed in quoting the passage I allude to:—"The air or climate is often regarded by the patient as possessing some specific quality, by virtue of which it directly cures his disease. This erroneous view of the matter not unfrequently proves the bane of the invalid, by leading him in the fulness of his confidence in climate to neglect other circumstances as essential to his recovery as that on which all his hopes are fixed."* The passage immediately following that just quoted is equally valuable, and, indeed, the whole Introduction, of which it forms a part, is so well adapted to the object it has in view, that I must refer the reader, who wishes for further information, to the work itself.

A great mistake prevails among many invalids, who,

* Clark on the "Sanative Influence of Climate," p. 9. Fourth Edition.

when directed to seek the shelter of our southern coasts, expect they shall enjoy the warmth of summer. Let me impress upon such the fact, that no such winter climate *exists in Britain.* All our *milder* winter retreats are merely *comparatively warm,* and the same caution as regards exposure and clothing is to be equally observed in them as in our more northern counties. This remark is by no means uncalled for, for it would hardly be credited that many invalids come to the Undercliff *totally unprepared with winter clothing!* Their fancy (founded on the inflated reports of friends, whose health may have been benefited there) leads them to imagine they are about to encounter the heat of the tropics, and their disappointment is as severe as their hopes were great.

From my own observation, as well as from the accounts of various observers, as also from the experience of invalids themselves, there are two distinct seasons here for invalid visitors. The first may be said to commence about the middle of October or beginning of November; and, as a general rule, such patients as arrive then may benefit by a change to Ryde, Clifton, or Brighton, as the case may be, or the season may allow, about the latter end of April or beginning of May. Those invalids, however, who have been confined to the house in London or in the northern counties, as also those who may have wintered at Hastings, will find a removal to the Undercliff from May to the end of July beneficial.

It may be here remarked that we have no good

spring climate in Britain, whatever may be said or written to the contrary. Indeed, in almost every region of the globe there is a particular season of the year, which, from its injurious properties, bears an analogy to our English spring. Madeira has its "L'Este;" Malta, its "gregale," as well as its "sirocco;" and Egypt its "chamsin;" while the "mistral" and "bise" shed their noxious influences over some of the better climates of Southern Europe.

With respect to the climate of this district during the latter part of summer and early autumn I am not aware, as I have before said, that it holds any superiority over most of our marine places of resort for invalids at this period. At that season the beauty of the locality usually attracts a large number of passing visitors, who derive the same benefit from a change to the pure marine air of the Undercliff, after probably a long confinement in a city, that they would by a removal to any other place where they would enjoy a similar advantage. In connection with the residence of visitors here during the summer, I may remark, that the *excessive heat*, so often mentioned to strangers as prevailing in the Undercliff at that season, exists only in the warped imagination of interested persons. If it is hot in the Undercliff, it is (as a general rule) hot elsewhere; but I have frequently known the influence of a summer's sun and a *still* air, felt most oppressively on the other side of the island, while the Undercliff has been enjoying throughout the day the effects of a refreshing breeze from the sea.

However beneficial this climate may be to a very large class of invalids during the latter part of autumn, the winter, spring, and early summer, I cannot withhold my decided objection to it as a residence throughout the year, except in individual cases. A change during the summer and autumn is not only desirable, but, in many instances, absolutely necessary, especially during the latter season.

The invalid months, if I may so express it, in the Undercliff, may be included from the beginning of October to the end of June or July; while the remaining ones court the presence of the tourist and seeker of pleasure.

A series of observations on the internal temperature of houses has, I believe, been rarely made for any lengthened period, yet the subject is certainly of great importance to invalids. There are many days during the winter and spring months on which it would be more than imprudent in a person labouring under pulmonary disease to expose himself to the open air; but it is desirable under such circumstances that the invalid should enjoy the benefit of an atmosphere which shall neither enervate nor depress him by uncalled for heat.

There can be no doubt that there exists a great difference even in the *in-door* temperature of different localities; and a person may enjoy to a certain extent, even when confined by weather to the house, the ad-

vantages and immunities which may be peculiar to particular climates.

A fall of temperature is rarely felt in-doors on the days on which it takes place in the open air, but the following day usually exhibits it, and hence we can account for the complaint so often made of feeling cold and chilly in the house when the external temperature does not give us the same impression. In like manner, a rise of temperature out of doors is not felt in the house at the precise time of its occurrence, though we are sooner conscious of a change than in the opposite case. Repeated observations on this point, made in the course of the series I am about to give, amply confirm the remark.

The following Tables contain the results of ten years' observations, made with the same care, and in a similar manner, to those given of the external temperature in the preceding chapter; and I cannot but hope they may prove interesting, as showing the in-door temperature of a climate without the auxiliary of artificial heat.

The observations were made in a hall 20 feet in height, having an aperture in the ceiling connected with a chimney out of doors; the floor paved with flagstones, and the external air freely admitted by means of the constant opening of the house door, and no fire ever being lighted in the place.

The mean annual in-door temperature deduced from ten years' observations, with register thermometers, is

56 ·30, while the mean external temperature is 51°·72, giving a difference of 4°·58, arising from the mere protection of the house without any artificial heat. The following Table shows the mean temperature in-doors for the seasons, and the external temperature is also added for the purpose of comparison.

MEAN TEMPERATURE OF SEASONS.

	Winter.	Spring.	Summer.	Autumn.
In doors	48·98	54·15	63·64	58·44
Out of doors.....	41·80	49·82	61·31	53·95

The difference during winter between the external and internal temperature it will be seen is 7°·18; in spring, 4°·33; in summer, 2°·33; and in autumn, 4°·49.

The mean temperature for each month in-doors is shown in the next Table, and the summary of the out-of-doors' observations for the same periods has been added as an interesting comparison.

MEAN MONTHLY TEMPERATURE.

Months.	In doors.	Out of doors.	Months.	In doors.	Out of doors.
January ...	48·41	41·25	July	63·88	61·36
February ...	48·14	41·12	August	65·21	62·47
March	50·23	44·50	September .	63·06	59·83
April	54·25	49·76	October.....	57·90	53·55
May	57·99	55·22	November...	54·36	48·47
June..	61·85	60·12	December ...	50·40	43·03

The variation between the external and internal temperature has been given in the following tabular form, for the purpose of showing at a glance the difference between them.

VARIATION OF THE EXTERNAL AND INTERNAL MEAN TEMPERATURE FOR THE DIFFERENT MONTHS OF THE YEAR.

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
7·16	7·02	5·73	4·49	2·77	1·73	2·52	2·74	3·23	4·35	5·89	7·37

From these Tables it will be seen that the greatest advantage derived from the mere protection of an inhabited house, without the immediate aid of such artificial heat as is produced by fires, exists during the winter months, when the in-door temperature exceeds that of the external air by more than 7°.

During the two first months of spring there is a difference of from $4\frac{1}{2}^{\circ}$ to $5\frac{1}{2}^{\circ}$, while during the next four months it does not amount to 3°. During the remaining months the difference between the external and internal temperature gradually increases in the ratio of rather more than one degree in each succeeding period, until it reaches the highest point of variation, which occurs in December.

The next point of interest in the comparison between the air out of doors and mean internal temperature, without the aid of artificial heat before alluded to, is the daily range of temperature, which is given in the following Table.

Months.	In-doors.	Out of doors.	Months.	In-doors.	Out of doors.
January	4·70	7·46	July	3·63	10·62
February . .	4·97	8·20	August	4·76	11·39
March	4·87	10·42	September .	4·55	11·09
April	6·24	12·84	October	4·28	9·53
May	4·50	12·82	November...	4·75	7·78
June.....	4·02	11·90	December...	4·52	6·96

The general equability of temperature in-doors under the circumstances above mentioned is remarkable, but this hardly could be the case were the observations to be kept in a chamber warmed by a stove or grate (unless very great care were taken in regulating the amount of heat), and few houses have the advantage of an apparatus adapted for adjusting the temperature by means of hot water, by which this difficulty might be obviated.

April exhibits the widest range both externally and internally, when a difference exists of more than 6°. The relative proportion however of the variation of the daily range of temperature externally and internally is not so striking, but the range occurs in an inverse ratio, the greatest range, with the exception of April, occurring in the winter in-doors, and the smallest in summer; while, generally speaking, the variation is least in winter out of doors, and comparatively greater in the latter part of spring and summer out of doors.

I will now advert to a subject in connection with internal temperature, which I believe to be of the

highest importance to a large proportion of invalids, and to which I think attention has hitherto been hardly sufficiently called; I allude to the relation between the external temperature of the atmosphere at certain seasons, especially during severe weather, and that of apartments occupied by invalids.

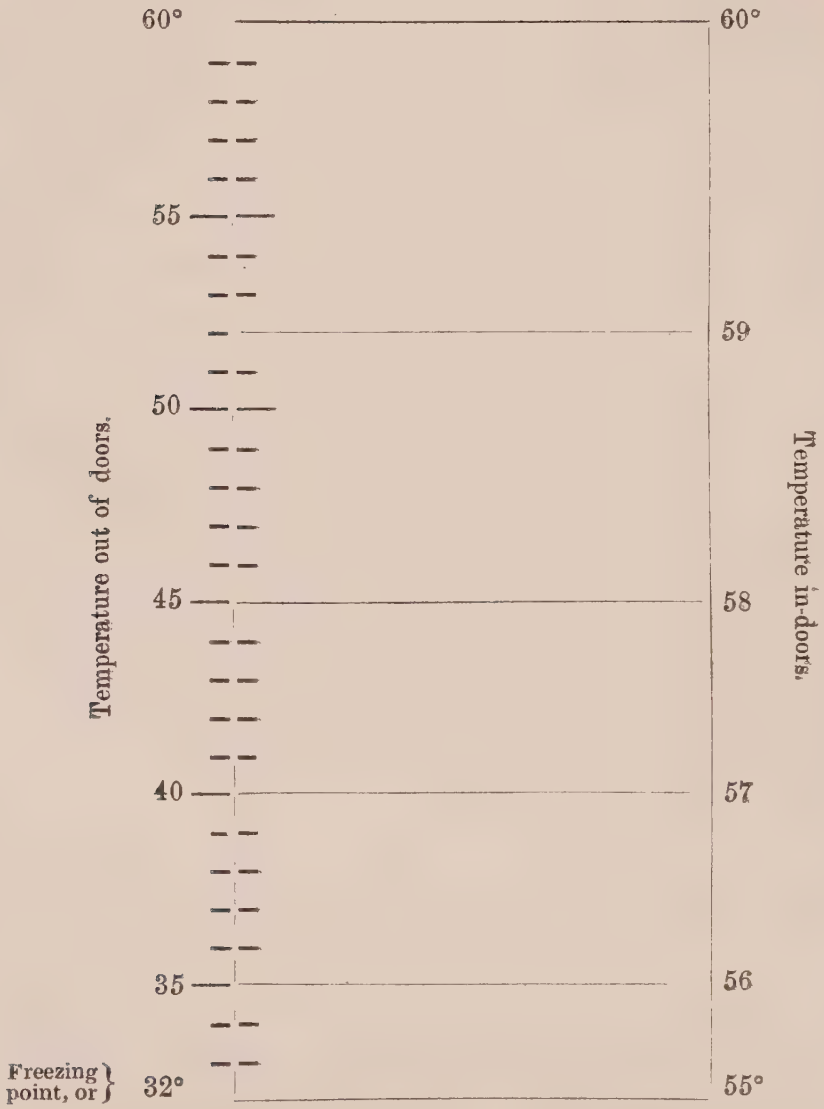
As a general rule, a temperature of about 60° of Fahrenheit may be the most desirable for invalids; but, unless a person be confined to two rooms, in which such a degree of warmth can be easily regulated (by warm water apparatus or other means), it is a matter of great difficulty to keep up so even a temperature; and more mischief frequently occurs by a change from heated rooms to other parts of the house than by moving from one apartment to another where a lower temperature prevails throughout the building, and which approximates more nearly to the colder atmosphere without.

Persons, and invalids especially, confined to rooms whose temperature much exceeds that of the external air, particularly in very cold weather, are apt to complain of feeling chilly, and, the more the heat of the apartment is increased, the more susceptible are they of this feeling.

In making this remark, it must not be forgotten that a large proportion of invalids are subject to a feeling of chilliness, and frequently so to a distressing degree, yet the sensation is greatly augmented in some instances by the causes above alluded to. I am per-

suaded more injury occurs to sick persons from inhabiting over-heated rooms than by using them at a much lower temperature. The air in the former instance becomes rarified, and the pressure of the external atmosphere acts in consequence more forcibly, and every little crevice, which under ordinary circumstances hardly gives evidence of its existence, now admits a jet of air, which, operating on the excited skins of those within its influence, produces not unfrequently inflammatory attacks of various descriptions, the origin of which the patient, being unconscious of any exposure, is at a loss to account for. It should be borne in mind that, in choosing a winter abode, small low-ceiled rooms should be avoided, and the term "*snug*" should find no place in an invalid's vocabulary. It is extremely difficult to regulate the temperature of such rooms, which readily become over-heated (especially in the evening), or inconveniently cold in the attempt to ventilate them.

It would be difficult, perhaps, to draw up directions in a tabular form, with anything like exactness, and suitable to all classes of invalids, for maintaining a temperature in-doors which shall approximate in such a manner to the changing atmosphere without, that, while we guard against the injurious effects of cold, we also avoid the almost equally pernicious consequences of an over-heated room. I have, however, been in the habit of recommending attention to something like the accompanying Table, and have usually found it answer the purpose intended.



The left-hand column indicates the external temperature commencing at 32° or the freezing point, a degree of cold which has hardly prevailed during the day-time in the course of the whole of my observations. The scale on the right hand is intended to represent the proper degrees of warmth to be employed in-doors, when the external air shows the temperature

affixed to the opposite scale. Thus, when the temperature out of doors registers 32° of Fahrenheit, the warmth of the apartment should be regulated at 55° below which it is undesirable an invalid's room should be kept. When the temperature, externally, advances to 35°, it should be increased another degree in-doors. From 35° to 40°, the internal warmth should be augmented a degree, as also from 40° to 45°, when referring to the table we shall find the thermometer in-doors would stand at 58°. From this point we advance another degree in-doors as the temperature externally rises to 52°, and another degree up to 60°, when the temperature both within and without is supposed to be identical.

The above rules are more particularly applicable to those invalids who are accustomed to take daily exercise in the open air, and have no reference whatever to such as are confined to a well-regulated temperature in two rooms. In the former instance, I have found attention to them most frequently prevent those annoying catarrhal attacks, as well as that distressing pulmonary irritation so frequently induced in some states of disease by alternations of temperature, and which is usually referred by patients to having taken fresh cold.

Many persons labouring under pulmonary affections are apt to imagine that, in seeking an appropriate climate for the winter, they have nothing more to do than to cast their eyes over a statistical table of the comparative warmth of different places during the colder seasons, and select the most *convenient* which

bears the highest rank on the scale. This is a sad fallacy, and one which many have to deplore when too late. Temperature, alone, is only one of the advantages to be regarded in this selection of a winter residence. Comparative degrees of *mildness* exist in extensive variety, but I have enumerated more particularly in the preceding chapter, the various qualities it is desirable should be superadded to this property in a climate, and a district may show a superiority of two or three degrees of temperature, and yet from various other causes be ill adapted to the exigencies of any particular case.

It is not intended in the foregoing passage to depreciate the superiority which a few degrees of temperature give to any particular locality, for, although the difference may not be appreciable to the feelings, still it exercises an important influence on the animal economy.

I have already mentioned how little dependence can be placed on our sensations with respect to temperature, but I may still further exemplify this remark in the following passage. Let us observe the impression made upon the system on a mild day during severe winter weather. We feel hot, oppressed, and relaxed; and the skin perhaps perspires readily, yet the thermometer indicates no greater warmth than 46° in the shade, or 55° in the sun. Again, let us take the occurrence of a cool day during a hot summer; the temperature perhaps registers 55° or more in the shade (the sun would probably be obscured); yet we feel

positively chilly. I have often heard persons just arrived from one of the northern counties of England complain of the oppressive heat of the Undercliff, while those who had been residing there for some time previous have felt all the sensations of cold. These facts will show how little we can estimate the real character of any climate by mere impression.

I have already noticed the feeling of chilliness to which invalids are liable, and it may also be remarked, that persons out of health are exceedingly susceptible to the impressions of cold or heat, as well as of change of weather. The sick person watches every shift of wind, and is conscious of every alternation of temperature, whilst to those in health such changes are imperceptible.

Somewhat of this susceptibility may probably be attributed to the mind of the invalid ever dwelling on the state of the weather, to him a subject of paramount importance, and one to which in former days, when unoppressed by disease, his attention had rarely been called, except as it might have interfered with some projected journey or excursion of pleasure.

In concluding this chapter it may not be out of place to offer some few remarks for the guidance of invalids during their residence in the Undercliff, and, as far as I am able, to give such hints as may tend to keep the mind of the sick person from dwelling too much on his own state.

For this purpose I have endeavoured in the two succeeding chapters to draw the attention of the visitor to

one of the most interesting studies in the wide range presented by the natural world, and, at the same time that I endeavour to take from the subject the austere mantle with which science is sometimes shrouded, and which might deter many from following so engaging a pursuit, I have attempted to make it not wholly uninteresting to the professed naturalist.

It is a matter of infinite importance that the invalid, who removes from home for the purpose of seeking health in any favoured spot, should, if possible, have some amusement and pursuit which may engage his attention, and, as I have before said, draw his mind from thinking too much on his state of health.

Gay society is in general incompatible with the prudence and care which is usually enjoined by the physician, and is also hazardous as involving exposure; but "to be able to procure its own entertainments, and to subsist upon its own stock, is not the prerogative of every mind. There are indeed understandings so fertile and comprehensive, that they can always feed reflection with new supplies, and suffer nothing from the preclusion of adventitious amusements. But others live only from day to day, and must be constantly enabled by foreign supplies to keep out the encroachments of languor and stupidity."

With the hope of obviating this disadvantage, I have attempted to awaken the attention of the invalid, whose strength will admit, and to endeavour to incite him to the prosecution of so delightful a study as that of Natural History. Its pursuit tends to arouse an

interest which is heightened by having all the charms of novelty, and, at the same time that the faculties of the mind are thus profitably employed, the exercise in the open air, which it necessarily involves, contributes to give vigour to the enervated frame, and the attendant excitement prevents the exposure from acting prejudicially on the system.

Natural History not only affords amusement to a large class of invalids, but allows of exercise on horseback in visiting the different places of resort of various animals, as also the localities in which he may enrich his collection of fossils or increase the interest of his herbarium. His ride is no longer the tame, dull affair which it appears to be, when taking exercise as a matter of duty; on the contrary, his horse is looked upon as merely subordinate to a purpose of more interest than a mere ride would afford, and his system is by this means put in the best condition for receiving all the advantages attendant on exposure to air and exercise on horseback.

To those, especially delicate females, who are physically unable to benefit by a long exposure and its consequent fatigue on the more noble animal, the useful and too frequently scorned ass affords by its gentle pace a desirable medium for exercise. At first the motion may appear irksome, and to many tiring and disagreeable; yet this feeling speedily passes away, and the invalid not unfrequently becomes attached to our humble friend, by whose means we are enabled to climb the steep ascent, and, in warm weather, inhale the invi-

gorating breeze of the heathery down, without experiencing the fatigue which would render such an undertaking on foot not only hazardous, but almost impracticable. The establishment of the well-known Isaac Sheath offers a fair choice of these lowly steeds, and the man himself possesses, under a dull and impassible exterior, much quaint shrewdness and intelligence, which, when extracted from him during a morning ride, affords not only amusement, but information.

It sometimes happens that an invalid may have started on an expedition of some distance, during a fine, bright morning of one of the later months of spring, promising himself all the enjoyment of a day which appears from its warmth and brightness to be a harbinger of approaching summer. If on such an occasion, however, especially with the wind in the east, he should observe the horizon at sea enveloped in a low bank of cloud or mist which obscures its usually well-defined outline, it would be as well if he deferred his projected ride and hesitated to venture far from home. The bank of cloud which rests upon the horizon is caused by the rapid evaporation which takes place at this season, from the action of a bright sun and cloudless sky; and, on the occurrence of a different current of air, the *sea fog*, for such it is, rushes with the velocity of wind towards the land, wrapping every object in obscurity, and creating an atmosphere of the most disagreeable chilliness, and highly prejudicial to the pulmonary invalid.

As I have before said, such visitations are comparatively unfrequent; nor do they always exist in the degree of intensity just mentioned, and rarely prevail above two or three hours; but the invalid should diligently shun them, and keep within doors during their prevalence. These *sea fogs* must not be confounded with the misty rain or fog which occasionally occurs in some seasons, especially during a warm winter; the former deposits no moisture, whilst the latter would wet to the skin.

With respect to sea bathing, invalids in general should recollect that it is by no means an impotent remedy, but one of such power that it becomes dangerous when improperly resorted to. The effect of the cold sea bath is to produce a sudden determination of blood to the more important organs, such as the brain, heart, and lungs; and, unless the system possesses sufficient reactionary power, the immersion is not unattended with risk.

Hardly a summer passes without some individual case coming under my notice of the ill effects produced by injudicious bathing; and in more than one instance I have known death occur from apoplexy, or the exhaustion produced by such imprudence.

In bathing in the sea it is desirable the body should not be exposed to its influence when feeling chilly or cold; but the warmth induced by a gentle walk to the beach, without of course producing anything like perspiration, places the system in the best condition to derive all the advantages it offers.

It is highly imprudent for any individual, however robust, to remain in the water for any great length of time, especially if its temperature be low; and many lamentable and fatal accidents have occurred within my own knowledge from this cause. The powers of the system have given way from the exhaustion induced by the prolonged exertion in swimming, and the continued exposure to the coldness of the water; and death has occurred before the shore has been attained.

I may here remark, for the guidance of those who excel in swimming, and whom the warmth of the water on any particular occasion may entice to swim to some distance from the land, that the current sets with considerable *force* FROM the shore, and, should a person chance to get within its influence, he would find some difficulty in reaching the beach again. An instance of the truth of this remark happened some few years back in consequence of a lamentable accident which occurred by the oversetting of a sailing boat off Shanklin. All of the party except the boatman were drowned; but he, being a good swimmer, contrived to disengage himself from his clothes, and endeavoured to reach the shore. To contend against the tide was impossible; and, as it was at the time running to the westward, Mill Bay, below Ventnor, offered the most desirable place for landing. All the most strenuous efforts of a strong man, struggling for life, were however ineffectual in consequence ef the *set* of the current within a short distance of the shore; and he would

undoubtedly have perished, had he not been observed from the beach, and a boat launched to his rescue.

Before closing this chapter, I may, perhaps, be allowed to address a word or two to the invalid respecting the care it is right he should observe in not keeping on boots or shoes after taking his walking exercise when there is the slightest moisture on the ground. Though the damp may have failed to penetrate to the stocking, its influence will be felt as soon as the exercise ceases, and its prejudicial effects perceived in the coldness of the feet, which will probably follow. Invalids should be careful to use *woollen* stockings or socks, and wear cork-soled boots or shoes, which should be exchanged for a pair well warmed, on returning from their usual exercise. This rule may be observed with advantage, not only when the ground is damp, but on every occasion of a walk.

I may also be permitted to call the attention of invalids to any change, however apparently trifling, that may take place in their condition, especially during warm, damp weather, in winter. Under such a condition of atmosphere the system is liable to venous and portal congestion, which, under unfavourable circumstances, sometimes tends to produce troublesome disorder of the more important organs, particularly the lungs and liver. A succession of dry, bracing weather, following a mild or relaxing period, is not unlikely to induce such a state, by creating a more active arterial circulation, while the venous system is as yet unrelieved; and it is to this cause we must look for the

effects produced by great and sudden changes of temperature. The medical attendant should at once be made acquainted with the fact, as very slight treatment in the first instance will most probably prevent any ill results which may be threatened, and obviate the necessity of a lengthened attendance.

The Undercliff, of course, presents many various sites suitable to the condition of different invalids, and it is a matter of great importance that a residence should be selected which is adapted to each peculiar case. For example, a very delicate invalid would probably suffer from selecting a locality whose beauty may have pleased the eye, but which, when robbed of its leafy screen by advancing winter, is far more exposed as a habitation than the particular case demands. On the other hand, the visitor who takes up his abode here for the winter as a mere precautionary step, and who is well equal to much exercise in the air, should seek the more open and elevated spots, which, although perhaps not quite so warm, are better suited to his state.

I will simply allude to some of the more sheltered localities which Ventnor and its vicinity possess, as some guide to the invalid, as well as protection to him against the representations of interested and irresponsible persons.

The houses situated between the road and the sea at Bonchurch stand in the most sheltered site in that romantic village, and the accommodation they afford is of the highest order. Bonchurch Terrace is more adapted to the less delicate class of invalids, and en-

joys a more tonic air than that possessed by the lower portions of the place. The hotel which stands at its commencement offers an admirable winter retreat to such as are indisposed to incur the trouble of housekeeping.

"Uppermount" being a private residence, requires no notice here, though during winter and spring a more sheltered or beautiful situation can hardly be found. "St. Boniface House" is most advantageously placed for securing the delicate invalid from the severities of a winter season.

Ventnor offers the same choice of situation as Bonchurch, with the advantage in one spot of a nearer approach to the sea. St. Boniface Terrace should be chosen by such as prefer a more bracing site, while "Spring Hill" offers more shelter, though with one or two exceptions the accommodation is inferior. The houses in "Grove Road" are well placed, and the position one well adapted to a large class of invalids. Various other spots in Ventnor offer a choice to visitors according to their respective conditions, and to the more robust "Madeira Vale" affords a retired and desirable retreat. Some of the houses near the church are likewise well suited to invalids, but the warmer and most sheltered part of Ventnor is the "Cove," and "Belgrave Road," which overlooks it. Houses of various sizes and descriptions are now erected on the spot, and its near vicinity to the beach, with its esplanade, together with the liveliness of its situation (altogether removed from the town), and its contiguity to

the sheltered walks and drives towards Steephill and St. Lawrence, render it perhaps the most desirable part for a residence, in this favoured place, to invalids and visitors in general.

The two large hotels, which occupy a prominent position in Belgrave Road, offer admirable accommodation to the winter visitors, at moderate rates.

CHAPTER V.

NATURAL HISTORY.

This district, so highly gifted with varied beauty, and a mild and healthful climate, presents a wide and interesting field to those who study Nature in her other and not less engaging shapes.

The Zoologist, no less than the Geologist and Botanist, will find abundant claim on his attention; and, if the Fauna of the Undercliff does not boast of much that is very rare, it at least possesses sufficient to interest him in the investigation of its treasures.

To the invalid whose strength will admit, and whose tastes may lead him to prosecute so pleasing a study as natural history, this locality offers an additional charm to that which it possesses in its beauty.

Air and exercise are most necessary not only for the restoration, but also for the preservation of health. I have already spoken of the facility which the climate of the Undercliff affords for both these essentials, and the study to which I am now alluding creates *an object* by which the valetudinarian may be stimulated to healthy exertion. Our great moralist says truly, "Natural History is no work for one that loves his

chair or his bed; speculation may be pursued on a soft couch, but nature must be observed in the open air."

It is not my intention in the following outline to attempt to give anything more than a brief history of the animal productions of the Undercliff; neither time nor opportunity have been afforded me for collecting sufficient materials for doing more in so wide and interesting a subject, and I am principally indebted to the kindness of friends for the information which I have been here enabled to bring together.

My chief wish has been to offer to the sojourner in search of health or pleasure such information as may, by inducing him to engage in a new and delightful study, tend to heighten his interest in the place, as well as afford an agreeable means of enjoying healthful recreation. It would, therefore, be foreign to my purpose to make this notice rigidly scientific; and to give a mere *list* of animals, with their particular places of resort, would only be useful to the practiced naturalist. I may, therefore, perhaps be permitted, on various occasions, to deviate from a strictly scientific form of description, and endeavour, by putting the materials I possess in a more popular shape, to smooth the path of the uninformed, rather than *alarm* him by mere dry detail.

MAMMALIA.

The arrangement I have adopted in the following description is taken from that of Professor Bell, in his excellent and interesting Treatise on British Quad-

rupeds; and I may here express my great obligation to my friend, the Rev. J. F. Dawson, for supplying me with a mass of information, and more perfect lists of all classes, than I otherwise could have hoped to obtain.

The mammals of the Undercliff, considering the limited space, are tolerably numerous, and not wholly uninteresting; we shall proceed first with the order

CHEIROPTERA, or Bat Tribe.

Vespertilionidæ. We possess four species of this genus, viz.:—

1. Vespertilio pipistrellus. *Common Bat, Flitter Mouse, or Pipistrelle.*

This species is common, and is well known to all who have seen the "weak-eyed bat flit by on leathern wing."

2. Vespertilio serotinus. *The Serotine.* This is a rare British species, and Bell does not seem to have been aware of its having been taken, except in the neighbourhood of London. A specimen was captured at Bonchurch, in 1844, and several have been taken in the neighbourhood.

3. Vespertilio Daubentonii. *Daubenton's Bat.*

Bell gives but two localities in Britain for this rare species, but it would seem to be by no means uncommon at the eastern extremity of the Undercliff.

4. Plecotus auritus. *Long-eared Bat.*

"This is one of the most common of the British

Bats." Yet with us it appears not to be of so frequent occurrence as the Pipistrelle, or even Daubenton's.

RHINOLOPHIDÆ. *Insectivorous Bats, with complicated nasal appendages.*

This is the second genus of the Cheiroptera, and the Undercliff, at present, is only known to possess one of the two British species.

1. Rhinolophus Ferrum-equinum. *Greater Horseshoe Bat.*

This species has been taken several times, and it is believed to be far from uncommon in this locality.

INSECTIVORA.

This is the next order to be noticed, and consists of three genera.

I. ERINACEADÆ. This genus contains a single species, the well-known Erinaceus Europeus. *Hedgehog* or *Urchin.*

This singular animal is universal in this district, and is universally killed. It has a bad reputation for destroying the eggs of game, and sometimes of entering hen-roosts for a similar purpose. Against the first accusation I fear it can hardly be defended, but the latter seems extremely problematical. Its sucking of cows and robbing of orchards are attributes which are now held to be fabulous. That it has its uses, and in this district I doubt not important ones too, in destroying the reptiles and noxious insects which abound here, I firmly believe, and I confess I always view with re-

gret the remorseless heel of the gamekeeper press upon the spiny ball, and thus expose its inhabitant to the destructive gripe of his terrier.

II. Talpidæ. This is the second genus, and contains, likewise, only one British species.

Talpa vulgaris. *Common Mole.*

This is another much persecuted animal, whose good and useful qualities are, I fear, but little understood or appreciated. It would seem to be more the farmer's friend than his foe; and the fact that large quantities of that destructive creature, the wire-worm (the larva of a coleopterous insect), which "neither fire will burn, nor water drown," being occasionally found in the stomach of the mole, to say nothing of the various other enemies to the agriculturist upon which it preys, and its usefulness in throwing up its hillocks, and thus raising the finer soil to the surface, whence it has only to be spread abroad to enrich the ground, proves that he is not the hurtful animal he is usually represented.

III. Soricidæ. This is the last genus of this order, and the Undercliff possesses, I believe, only one species.

Sorex araneus. *Common Shrew Mouse.*

This species is common, and the fields in autumn exhibit the usual amount of dead shrews. Can this mortality be at all attributable to their well-known pugnacious qualities? Did it take place in the spring, it might have been, perhaps, accounted for in this manner.

CARNIVORA.

To this order belongs the genus MUSTELIDÆ, or Weasel tribe, of which the Undercliff contains three species.

1. Mustela vulgaris. *Common Weasel.*

This graceful little animal appears to be another of those more sinned against than sinning. The good service it does the farmer, in clearing his corn-ricks and barns of the myriads of mice with which they are so frequently infested, certainly more than counterbalances any injury the gamekeeper may receive at his hands, by the occasional destruction of a rabbit, or even a stray partridge. This species is not so frequently found here as the

2. Mustela erminea. *Ermine Weasel, Stoat,* or *greater Weasel.*

This animal is very frequent in this district, as well as in other parts of the island; and its fur sometimes undergoes, even in this comparatively warm locality, the change of colour, for which this species is remarkable; but those I have seen have rather been of a dingy yellow than approaching to the pure white, for which the ermine of a more northern clime is so famed and valued. I fear, much as I may feel inclined to protect the graceful little weasel from universal annihilation, the rapacious stoat would find but little favour with me; its habits and singular courage induce it to attack and overcome animals much larger than itself, and the

keepers' preserves are undoubtedly freely invaded by this bold little creature.

3. Martes abietum. *Pine Marten.*

This is the last species of the Mustelidæ the Undercliff is known to possess, and it is introduced here on the authority of the Rev. J. F. Dawson, whose reputation as a naturalist is too well established to leave any doubt of the existence of this animal in the district. This gentleman was passing near the "Orchard," the residence of Sir Willoughby Gordon, when his attention was attracted to an animal he had not previously remarked in the island. He approached it to within a very short distance, and continued to watch it for some time, and he was thus enabled perfectly to identify the species. His report is still further corroborated by the fact of the track of a marten having been since seen in the neighbourhood, by a highly competent authority. The late Lieutenant Jonathan Peel, R.N., also saw a pair of these interesting animals in the Landslip at East End, a few years previous to that seen by Mr. Dawson.

Felidæ. This is the next genus to which I shall allude under the order of the Carnivora, and, though I am aware objection may be taken to the instance of a wild species occurring, still I think it not unworthy of a passing notice, if only to bring forward evidence, however slight, of the wild and domestic cat being identical.

Felis Catus. *Wild Cat.*

Although the cliffs in this district abound with nu-

merous individuals of the feline race, who, having early escaped the trammels of domestic life, have taken up their abode in the rocky recesses, and returned almost to the savage wildness of their *original species*, still I have met with one specimen which appeared to corroborate, in some measure, the traditionary report of the existence of the wild cat in the Undercliff. The animal alluded to was captured in a large gin in the grounds of Steephill Castle, some few years back, and its leading characteristics and general appearance approached very closely to the specific characters usually given. It exhibited unwonted fierceness, and, notwithstanding its movements were confined by the heavy iron trap which held it captive, its ferocity was such that it defied the approach of dog or man, and was only killed after repeated assaults with heavy bludgeons. It bore but little resemblance to the domestic cat; and the thick bushy tail, shorter than is usually met with in the latter animal, with the peculiar colour and dark stripes of the fur, seemed to favour the idea that the report of this species inhabiting the Undercliff was not altogether fabulous.

Canidæ. Passing over the different breeds of dogs which belong to this genus (there being none peculiar to the district), I am brought to notice the well-known species

Vulpes Vulgaris. *Common Fox.*

The original boast that this island contained no foxes has long since been obsolete; but, to my personal knowledge, they were very rare in the southern

part within these very few years. A mangy old dog fox was killed, I forget whether by harriers or not, in the neighbourhood of Shanklin, about eight or nine years ago, and the circumstance of meeting with one was considered as very unusual. The Undercliff was at that period entirely free from them; and the first evidence I had of any of the species being in the vicinity was seeing a tramper march through the then village of Ventnor, about five or six years ago, with a fine, fat, young fox hanging over his shoulder, suspended from a stick. He had caught Reynard, "napping," near Luccombe Chine, and despatched him without trouble. Since this period, however, foxes have greatly multiplied, and I believe I may now say they literally abound; and, from the utter impossibility of hunting them among the precipices here, and the proverbial sagacity of the animal in avoiding traps, I think it very unlikely they will ever be entirely dislodged from their rocky fastnesses.

I need hardly add, there is scarcely a poultry-yard in the neighbourhood but has been cognizant of Reynard's vicinage; and his successful forages have in some instances been attended with serious loss to the proprietor, and no small inconvenience to the public, by limiting still further the previous not over-abundant supply of poultry.

The fox has been introduced for the purpose of affording amusement to the officers in garrison, at Parkhurst, and various gentlemen connected with the island, and a pack of fox hounds is kept. Had Rey-

nard confined the sphere of his predatory exploits to the more open and champaign part of the island, and not sought refuge amidst the rocks of the Undercliff, he would have afforded better sport to his admirers, and rendered the poultry keeper here more contented. It has been said that a bill in parliament was at one time procured by the gentlemen of the island for securing the farmers from the depredation of foxes and other vermin, and, according to one account, the offence of letting a fox loose was punishable with transportation.

PHOCIDÆ. The Seal Tribe.

A report had long prevailed that seals occasionally frequented the shores of the island; but, until very recently, I am not aware of an instance in which an individual of this kind has been captured. A conflict which occurred one night, a few years since, on the sands at the foot of Shanklin Chine, between one of these animals and the coast-guardsman on the beat, who mistook it for a savage dog, and was obliged to use his cutlass to defend himself, proved that they sometimes visited our coast, the true character of the beast being shown when daylight appeared by the tracks left in the sand. An animal of the same kind was also seen on another occasion; and he seems to have remained some time in the neighbourhood, as traces were frequently observed.

On the 15th November, 1848, the coast-guardsman on duty between Shanklin and Sandown observed, in the dusk of the evening, what he imagined to be a

body lying on the beach, and, approaching it, touched it with his stick. He was startled by a somewhat unearthly growl; but, quickly recovering himself, he attacked the strange creature, for such he now perceived it to be, and succeeded in despatching it. It was brought to my house a day or two afterwards, and I had the opportunity of examining it. The head was flat, and the neck long; the coat consisted of short shining hair, without any fine fur underneath, of a dirty grayish colour, approaching to dingy white on the neck and belly, which were covered with dark black spots, similar to those of a leopard. *The molar teeth were not set obliquely in the jaw, and the tubercular appendage occurred only in those situated posteriorly;* in the two foremost ones it was wanting, and in the others not very prominent. The length of the toes of the hinder feet occurred in exactly the same order as mentioned by Bell, when describing the Grey Seal, in his "British Quadrupeds," and the peculiarity of the teeth leads me to believe the specimen to be one of the

HALICHÆRUS GRYPHUS. (*Phoca gryphus*. Fabr.) *Grey Seal.*

I regret the cupidity of the man who possessed it placed it out of my power to obtain it for Professor Bell, which I had hoped to do.

The capture took place most opportunely, as it has afforded me the means of establishing the fact of the occurrence of the animal within a very short distance of the shores of the Undercliff; and the name given

to a rock in Mill Bay, called the "Seal Rock," from the tradition that it used to be the resort of this animal, renders it highly probable that it still occasionally visits our district.

RODENTIA.

There are four genera in this order, belonging to the Undercliff:—

I. SCIURIDÆ, or Squirrel Tribe.

1. Sciurus vulgaris. *Common Squirrel.*

This graceful little animal is very scarce in the Undercliff, though I believe abundant enough in Parkhurst Forest, and woods on the north of the island; and mention is made, in Worsley's History, of its being seen leaping from tree to tree among the thick foliage of those localities.

2. Myoxus avellanarius. *Common Dormouse.*

This beautiful, but retiring little creature, which forms so perfect a link in the great chain of classification between the genus to which it belongs and that which follows it, abounds in the Undercliff; and a captive of the species is not unfrequently seen in the cottages of our peasantry.

II. MURIDÆ, or Mouse Family.

I am not aware that the first species noticed in Bell's "Quadrupeds" of this troublesome genus, the Mus Messorius, or *Harvest Mouse*, has ever been found in this district, although it is an inhabitant of

other parts of the island, and I therefore proceed to that destructive pest in our fields and gardens.

1. Mus sylvaticus, or *Long-tailed Field Mouse.*

This species of the Muridæ is common enough, as both our gardeners and farmers can testify. They are exceedingly destructive to the early sowings of peas, beans, and other crops, and are accordingly universally destroyed; yet, I must confess, I have often felt regret that a stern necessity should compel us to dim the lustre of so beautiful an eye as this mischievous little creature possesses.

2. Mus musculus. *Common Mouse.*

This annoying little plague is as abundant here as elsewhere, and its habits are too well known. The only allusion necessary to make is to recommend the employment of a good cat as the only certain means of exterminating this troublesome animal.

3. Mus decumanus. *Brown Rat.*

This most ferocious of his race also abounds here, though I think he confines his places of retreat more to stables, barns, and loose rocky banks, than to the houses of the inhabitants. This may probably arise from the recent erection of our buildings; for I doubt not, as time wears on, he will invade these also, according to his universal custom.

4. Arvicola agrestis. *Field Vole,* or *Short tailed Field Mouse.*

Of the family of Voles, this is the only species the Undercliff is at present known to possess. It is con-

sidered the most destructive of its kind, and is far too common with us.

III. LEPORIDÆ, or Hare Tribe, contains two well-known species.

1. Lepus timidus. *Common Hare.*

The hare, though by no means so numerous as throughout the rest of the island, was at one period not unfrequent in the Undercliff. Its numbers have, however, of late years been gradually diminishing, as the district has been built upon, and more resorted to, and I doubt not that the species ere long will be very rare.

2. Lepus cuniculus. *Rabbit.*

The Rabbit may be said to have existed at one time in more than the usual amount in this district; every bank had its burrow, and every hollowed rock its retreat. Since, however, the fox has formed a habitation here, its numbers have greatly decreased; and the more watchful care of the farmer over his growing crops, together with the venatorial propensities usual to the idlers of a town or village, have tended considerably to diminish the species. Varieties of the animal, both black and white, occasionally occur.

3. Cavia Aperea. *Restless Cavy*, or *Guinea Pig.*

Bell comprises this harmless little animal in his list of British Mammalia; and I notice it here, in consequence of an attempt made a few years back by my

friend, Oscar Hambrough, Esq., to naturalize it in the grounds at Steephill Castle. For this purpose a considerable number were turned loose, in what was considered the most favourable part of the domain, for the experiment; but, from the day on which they were liberated to the present hour, no trace of any one of them has been seen. Whether they fell a prey to the more rapacious animals which frequent this lovely spot, or perished by failing in instinct to procure their usual food, it is not easy to say; but it appears somewhat singular that no remains of them should ever have been discovered.

With this account I conclude the imperfect information I have been enabled to give of the different species of Mammalia inhabiting the Undercliff or frequenting its shores. I have abstained from any notice of the various breeds of horses, cattle, sheep, or dogs, as the district possesses in these particulars nothing peculiar to it; and I shall therefore finish this section by briefly adverting to those inhabitants of the deep belonging to the class which are common to our coasts, or have at various times been accidentally cast upon our shores.

CETACEA,

OR WHALE TRIBE.

DELPHINIDÆ. Of this genus, two species alone will be referred to.

1. Delphinus griseus. *The Grey Dolphin.*

An individual of this species ran on shore, and was killed, at Puckaster Cove, in 1843. The skull is in the British Museum, but the animal itself was irretrievably mutilated before it could be secured for the purpose of scientific description. It is new to Britain. Cuvier gives, as its habitat, the neighbourhood of Brest.

2. Phocæna communis. *Common Porpoise,* or *Sea Hog.*

The porpoise is frequently seen, in considerable numbers, passing within a very short distance of the shore, at various seasons of the year.

Balænidæ, or Family of True Whales.

Balæna Boops. *Northern Rorqual,* or *Fin Fish.*

An instance of this huge creature being stranded on the coast of this island occurred in Alum Bay, in 1842. As its remains have since been established in a fitting receptacle at Black Gang, I have thought it worthy of a notice here. Those interested in the wonders of creation will find neither time nor money ill bestowed in visiting the skeleton of this stupendous monster of the deep.

ORNITHOLOGY.

I shall now endeavour to give such a description as my materials will permit me of the Birds of the Undercliff; and in this attempt, as well as that of the

Mammalia, I am indebted to the assistance of my kind friend, the Rev. J. F. Dawson, in supplying me with a list of species and much other information. Taking Yarrell for my guide, as I have previously done Bell, I shall follow out the system adopted in his well-known and excellent treatise on the "History of British Birds," and endeavour to awaken in the mind of the reader an interest in the feathered tribes inhabiting or visiting our shores and rocks. And, first, the

RAPTORES.

Under this order is included the genus

FALCONIDÆ, or Falcon Tribe, of which we shall notice the following species:—

1. Falco chrysaëtos. The *Golden Eagle.*

Much as I should like to claim for the Undercliff an extensive list of interesting and noble species, I fear we are hardly entitled to insert this majestic bird as now belonging to our Fauna; and I only mention it here, to show that it is not unlikely it was once a visitor of our rocky fastnesses. A well-authenticated instance of the capture, in this immediate neighbourhood, near Appuldurcombe, of an individual of the species occurred in 1828. It was observed for three or four weeks before it was wounded, and afterwards taken, and had committed some ravages amongst the lambs in the neighbourhood. It lived in confinement only about ten days, and refused food. The remains, which might well have claimed a niche in a

museum of natural history for the island, did such exist, were affixed over the dairy door in Appuldurcombe Park, from whence the skull and neck were rescued by the Rev. C. A. Bury, late of Bonchurch, to whose entertaining and valuable papers on the natural history of the Isle of Wight, published at various periods in the "Zoologist," I am indebted for much useful information.

There is also a tradition of the eagle having formerly had its eyry in the high cliffs of the Undercliff; and mention is made, in Warner's History of the island, of the bird having been known to build in Culver Cliff; and he gives the year 1780 as the period of its last visit. The fact seems probable, as he mentions the young birds as being "of the ring-tail species," which appears sufficiently to point it out as the Golden Eagle, the young of that noble bird being sometimes so denominated. The nest of this bird, containing one eaglet was taken, but the captive soon died.

2. Falco haliæëtus. *The Osprey.*

"Is occasionally seen on our coasts," and has been shot on the cliffs near Freshwater.

3. Falco peregrinus. *The Peregrine Falcon.*

However doubtful the propriety of inserting the two former species as belonging to this district may appear, there can be no uncertainty of the bird now under consideration being a constant inhabitant of our rocky heights. In the reign of Queen Elizabeth, a warrant was sent to Richard Worsley to search for her Majesty's hawks in the Isle of Wight, which had been stolen

"from the place where they bred on her Majestie's own lande." Now, the crown appears at that period to have possessed a certain interest in land at Niton; and it is not unreasonable to suppose that the hawks above referred to were ancestors to the Peregrines which are still accustomed to build in the neighbourhood. Yarrell gives but one locality in the Isle of Wight where it breeds; but a pair of these once prized creatures have for a long period been in the habit of building in the high cliffs between the Sand Rock Hotel and Black Gang. A brood from this pair came into my possession a few years since, and I was fortunate enough to rear them, and to keep them for a considerable period. Their noble statue-like appearance, when perched upon different stands made for the purpose, gave to my garden a title of interest such places do not often possess.

The amazing power of these birds may be judged of, when I relate the fact, that one of those above alluded to (a female) once took wing, carrying with her a piece of lead attached to the leg by a chain, weighing together half a pound, and with this appendage flew to a distance of full a quarter of a mile; when (whether from being embarrassed with the weight, or that her untried pinions refused to serve her further), in consequence of a strong wind blowing at the time, the poor bird was carried seaward, and would have found a watery grave, but for the prompt assistance of a passer by.

In 1841 a pair of these noble birds built in the cliffs

at the Landslip, at the east end of the Undercliff; but, one of the parent birds being unfortunately killed just after the brood were hatched, the nestlings were starved, and the remaining bird quitted the neighbourhood. A pair of Falcons has also been located on the cliffs between Luccombe and Shanklin, in this immediate vicinity, for some years past, and appears to be permanently resident.

4. Falco subbuteo. *The Hobby.*

This bird is an occasional visitant in our neighbourhood, and an individual was shot in the Landslip at East End in October, 1841.

5. Falco æsalon. *The Merlin.*

Although sometimes seen, does not breed here.

6. Falco tinnunculus. *The Kestrel.*

This well-known little creature is more than ordinarily abundant throughout the whole extent of the Undercliff, and it may be continually seen poising itself in the air and scanning the fields below with its piercing eye, in search of its accustomed prey.

From what I have observed of this bird in captivity, I should feel inclined to rescue it from the obloquy cast upon it by the contributor to the "Zoologist" before named, for its want of courage. I will mention an instance which I think will go far to disprove the charge. At the period I possessed the Peregrine falcons before mentioned, I also kept a kestrel: this bird appeared gifted with very different qualities from its noble fellow-captives; and, while the latter would sit quietly on a well-gloved hand, the former irritable little

creature could hardly be persuaded to allow itself to be touched, and would occasionally attack indiscriminately man or woman, dog or cat, that might chance to pass through the garden,—no very strong proof of its lack of courage. On the occasion to which I am about more particularly to allude, the falcons, being then full-grown noble birds, had just received their usual portion of food, and, having pounced upon it, regained their perch, holding the morsel in their claws, and watching with an eager glance the movements of their feeder, to see if they had received all that was due to them. The little kestrel had also had its portion, and was busily engaged in gorging it, when, seeing the tempting bit still retained in the clutch of its powerful neighbour, it left its own half-finished meat and pounced upon that of the falcon, and succeeded in snatching it from his grasp. The first feeling of the noble bird was evidently that of intense surprise, but, rapidly recovering from it, he dashed upon the little pillager and speedily recovered the spoil, without taking further vengeance on the spoiler for his temerity. I should, however, mention that my poor little kestrel was not equally fortunate on another occasion, in one of the frequent instances in which he braved the anger of his powerful antagonists; the ire of the nobler bird was awakened, and with one stroke of his beak he laid his little foe dead at his feet.

7. Falco nisus. *The Sparrow Hawk.*

Visits us, but I believe does not breed in the Undercliff.

8. Falco buteo. *The Common Buzzard.*

This species has been occasionally seen in the district.

9. Falco cyaneus. *The Hen Harrier.*

Is not unfrequent in the island, and is sometimes seen in the Undercliff.

STRIGIDÆ, or Owl Tribe.

We have three ascertained species of this genus which are either resident, or occasional visitors of the Undercliff, or its immediate vicinity.

1. Strix brachyotos. *Short-eared Owl.*

Is a pretty regular winter visitant on the Downs at the summit of St. Boniface.

2. Strix flammea. *The White* or *Barn Owl.*

This, which is the common species, and may be considered the type of the true owls, is tolerably frequent.

3. Strix stridula. *The Tawny Owl.*

The Tawny Owl has been observed in the Undercliff; but my friend, Mr. Dawson, denies that it breeds there.

INSESSORES,

OR PERCHING BIRDS.

The first genus to be noticed under this order is that of the

LANIDÆ, of which the Undercliff possesses but one species.

1. Lanius collurio. *Red-backed Shrike.*

This bird is a frequent summer visitor with us. A pair bred in my garden two or three years back; but,

although I endeavoured, after I became conscious of their presence, to find some evidence of the peculiar quality from which they derive their specific name (Lanius, *Butcher*), I was unable to discover any instance of this singular propensity.

MUSCICAPIDÆ. The Fly Catchers.

The Undercliff possesses one species.

1. Muscicapa grisola. *The Spotted Fly Catcher.*

"Visits us regularly, and remains to breed."

MERULIDÆ. This genus contains the thrushes and other interesting species.

1. Turdus viscivorus. *The Missel Thrush.*

Is common everywhere.

2. Turdus pilaris. *The Fieldfare.*

This bird is one of our usual winter visitants, and attracts, as usual, each idler who can borrow a gun during the severer weather. It sometimes visits us in more numerous flocks than are usually seen; and the following curious fact, tending to illustrate the instinct of birds in seeking food, which occurred during the winter of 1846–7, may be here mentioned.—A fall of snow taking place at the time the frost was most intense, numerous flocks of fieldfares, redwings, starlings, larks, and other small birds, were observed to pass from the opposite coast of Hampshire to the Isle of Wight; many perished from exhaustion in the Solent, before they reached the shore, and some were picked up dead on the pier at Ryde. In a day or two hardly a bird of the description mentioned was to be seen on the north side of the island, while the Under-

cliff was literally alive with them. Not only did the fields swarm with the feathery race, but the most inclosed gardens were invaded, and great was the destruction to the tender vegetables which had withstood the rigour of the season, every leaf being eaten as if consumed by the caterpillar. Their instinct had evidently led them to seek that spot where vegetation still braved the withering frost, and where the warm rays of the sun had caused the snow to disappear, and so far softened the ground, that they were more readily enabled to search for their accustomed food.

3 Turdus musicus. *The Song Thrush.*

This well-known songster pours forth his pleasing notes in the Undercliff at all seasons of the year, and may be heard on a bright winter's morning, enlivening our shrubberies with his song. He is, however, as well as his congener, the blackbird, one of the most destructive creatures in our gardens; and no early fruit can possibly be preserved from his ravages unless most closely netted. So intent are these birds in pursuit of their favourite food, that I have known six caught in one morning in a net which covered a strawberry bed in my garden.

4. Turdus iliacus. *The Redwing.*

This species is said to be more abundant in the district than the fieldfare, though, at the period mentioned in the anecdote related under the notice of that bird, the latter appeared equally numerous with the redwing.

5. Turdus merula. *The Blackbird.*

Is as frequent here as in any locality I have ever known it, and tests the patience of our gardeners by its more than common destructive powers. No fruit comes amiss to him, and I have known the produce of a tree of beautiful jargonelle pears more than half destroyed during a single morning by this voracious bird. He also attacks the peach, nectarine, and apricot; and he who seeks to preserve his fruit-crops in the Undercliff from this and other of the feathered tribe has need to take more than ordinary precaution against their depredations.

6. Turdus torquatus. *The Ring Ouzel.*

This interesting visitor to our locality generally makes its appearance in spring and autumn, in its migratory passage to and from warmer climates. It is occasionally tolerably frequent, especially in the landslip at the eastern extremity of the Undercliff, and "not less than one hundred individuals of this species were observed flying about this locality in October, 1841."

Sylviadæ. This genus contains many well-known as well as interesting species. The first to notice is

1. Sylvia modularis. *The Hedge Sparrow, Warbler,* or *Accentor.*

This "truly domestic" little bird, as Yarrell designates it, abounds with us, and its melodious notes, if wanting in power and variety, are heard in every inclosure at periods of the year when other feathered songsters are neither so melodious nor so loud.

2. Sylvia rubecula. *The Redbreast.*

Our well-known friend, the robin, is equally inclined to exhibit its social character here as elsewhere.

3. Sylvia phœnicurus. *The Redstart.*

This is one of our summer visitors, and is tolerabl plentiful on its first arrival.

4. Phœnicura Tithys. *The Black Redstart.*

This bird also visits us, but its occurrence is very rare; a pair has been shot at different periods at Bonchurch and its immediate neighbourhood.

5. Sylvia rubicola. *The Stone Chat.*

Is very abundant, and sometimes breeds on our downs as early as the 8th of April.

6. Sylvia rubetra. *The Whin Chat.*

Is also one of our visitors, but not of common occurrence.

7. Sylvia Œnanthe. *The Wheatear.*

This graceful little bird, which has sometimes obtained, from its delicious flavour, the name of the English ortolan, is found in abundance with us, frequenting not only our downs and fields, but also our gardens.

8. Sylvia salicaria. *The Sedge Warbler.*

Occurs occasionally as a summer visitant, and is frequent in the marshes in the interior of the island.

9. Sylvia luscinia. *The Nightingale.*

This inimitable songster is found abundantly in the Undercliff, and throughout the island generally. Bonchurch was formerly a particularly favoured locality; but the building which has lately taken place there

seems, for the present, to have disturbed the vocalist of night, and we must seek its unrivalled notes in the more quiet and retired spots towards St. Lawrence and Niton. I need not do more than allude to the surpassing sweetness of its song when heard echoing among our wooded cliffs in the silence of a calm summer's night; the distant breaking of the wave just gives sufficient diversity to heighten the enjoyment, and prevent monotony. It has been heard with us as early as February.

10. Sylvia atricapilla. *The Blackcap Warbler.*

The blackcap is also one of our welcome summer-visitants, and is not unfrequent.

11. Sylvia cinerea. *The Common Whitethroat.*

Abounds with us, and is one of the most destructive little creatures which infest our gardens during the fruit season.

12 Sylvia trochilus. *The Willow Warbler.*

Visits us about the middle of April, and shortly after that period abounds.

13. Sylvia hippolais. *The Chiff Chaff.*

This pretty little bird is one of our earliest visitors in the spring, and with its unceasing note reminds us of the change of season.

14. Sylvia Dartfordiensis. *The Dartford Warbler.*

This species has been occasionally observed on St. Boniface Down, and has been killed at no very great distance from the neighbourhood.

15. Sylvia regulus. *The Golden-crested Regulus.*

This little creature is one of the smallest, as well as

one of the prettiest, of our native birds, and is very abundant with us.

Paridæ. This genus contains the Tits, and the Undercliff possesses four or five species of them.

1. Parus major. *The Great Tit.*

Is abundant, and its grating note, resembling the setting of a saw, is heard in every garden in early spring.

2. Parus cœruleus. *The Blue Tit.*

This restless, impudent little bird is as common with us as elsewhere, and I fear Mr. Selby would find but few converts among the gardeners in our neighbourhood to his opinion, that they are more serviceable than destructive.

3. Parus ater. *The Cole Tit.*

Has been met with at Bonchurch.

4. Parus palustris. *The Marsh Tit*

Is not common with us.

Parus caudatus. *The Long-tailed Tit.*

It is more frequently met with than the preceding species.

Motacillidæ comprises the Wagtails.

1. Motacilla Yarrellii. *The Pied Wagtail.*

This bird, which was always considered identical with the continental species (M. alba of Linnæus), proves to be distinct, and has been named after that eminent naturalist, W. Yarrell, Esq.: it is numerous in the Undercliff.

2. Motacilla boarula. *The Grey Wagtail.*

Visits us in winter, but in no great numbers.

3. Motacilla flava. *Ray's Wagtail*

Is a frequent visitant in the spring, but is more rarely seen as the season advances.

Anthidæ. This genus contains the Pipits.

1. Anthus pratensis. *The Meadow Pipit.*

This little bird, which is better known under the name of the titlark, is common with us.

2. Anthus petrosus. *Rock Pipit.*

This species, though numerous on the sea-shores of the Undercliff, is rarely met with on the northern coast of the island.

Alaudidæ. Two of our most favourite songsters belong to this genus.

1. Alauda arvensis. *The Skylark.*

This rival of the nightingale is very common with us, and, when severe weather occurs, vast flocks of this species take shelter in the Undercliff, and invade the most inclosed gardens in search of food.

2. Alauda arborea. *The Wood Lark.*

This bird is not common with us, though by no means unfrequent during severe weather.

Emberizidæ. The Buntings.

1. Emberiza glacialis. *The Snow* or *Tawny Bunting.*

I include this bird in the number of our occasional visitors, on the authority of the Rev. J. F. Dawson.

2. Emberiza miliaria. *The Common Bunting.*

Is not so common in this district as many others.

3. Emberiza citrinella. *The Yellow Bunting, Yellow Ammer* or *Hammer.*

This well-known lively little bird adorns every hedge.

4. Emberiza cirlus. *The Cirl Bunting.*

This bird is common in the island, though rare in the northern counties.

FRINGILLIDÆ. This genus contains the Finches.

1. Fringilla cœlebs. *The Chaffinch.*

Is abundant with us, but its handsome plumage and sprightly habits do not gain it greater favour with our gardeners here than they do elsewhere.

2. Fringilla montifringilla. *The Mountain Finch,* or *Brambling.*

The Brambling is one of our winter visitors, but is not of common occurrence.

3. Fringilla montana. *The Tree Sparrow.*

I have inserted this bird here, as the Rev. C. A. Bury mentions, in the "Zoologist," having observed it in the neighbourhood of Shanklin. It is, however, very rare.

4. Fringilla domestica. *The House Sparrow.*

In no part of the world that I have ever visited, have I failed to find this noisy, impudent bird; and the species is as abundant in this neighbourhood as in other places.

5. Fringilla chloris. *The Greenfinch.*

Is a common bird with us.

6. Fringilla carduelis. *The Goldfinch.*

This beautiful little favourite abounds with us, and is one of the few of the genus whose presence in our gardens is always welcome, and whose good services are unalloyed by mischievous habits

9. Fringilla linota. *The Common Linnet.*

Is another of the useful little frequenters of our gardens, and is very abundant.

8. Loxia Pyrrhula. *The Bullfinch.*

Much as I am inclined in general to overlook the damage done by certain mischievous species of birds, and allow that many useful qualities compensate for their destructive ones, I fear this little pest to our fruit trees will find no favour in my eyes. It is very common in the Undercliff, and its ravages among the young buds in our gardens, towards the end of winter or early spring, are so great, that in my own garden no hope of fruit on gooseberry, pear, or plum can be entertained, without the trees and bushes being closely covered until the flower bud has partially expanded. It not unfrequently attacks the wall fruit, and many a promising crop of apricots has been completely cut off by this destructive little creature.

9. Loxia curvirostra. *The Common Crossbill.*

Occasionally visits us in considerable numbers.

Sturnidæ. The only species of this genus belonging to the Undercliff is the

1. Sturnus vulgaris. *The Common Starling.*

Which is tolerably numerous.

Corvidæ. This genus contains the Crows.

1. Corvus graculus. *The Chough.*

This bird is said to have been of frequent occurrence on our coast, and it is still reported to breed in the cliffs between Niton and Black Gang, where I saw one last May (1848).

2. Corvus corax. *The Raven.*

Builds in our rocky cliffs, and is by no means uncommon; it may very frequently be seen wheeling in the air at a considerable height, and giving notice of its presence by its peculiar croak.

3. Corvus corone. *The Carrion Crow.*

Is also common with us.

4. Corvus frugilegus. *The Rook.*

Frequents this district in considerable numbers; and there is a rookery in the high trees at Mirables, whence, as well as from Appuldurcombe, they are principally derived.

5. Corvus monedula. *The Jackdaw.*

No one who visits the Undercliff can be long unconscious of the presence of these noisy birds, which breed in great numbers in the cliffs from East End to Black Gang.

Corvus pica. *The Magpie.*

This artful, mischievous species is far too numerous in this locality.

7. Corvus glandarius. *The Jay.*

Is by no means unfrequent.

Picidæ. To this genus belong the Woodpeckers; but I am not aware of any one of the species having been known to occur in the Undercliff; and the only individual to be mentioned under this head is the

1. Yunx torquilla. *The Wryneck.*

This bird is better known in this district as the "barley bird," from the circumstance of its usually arriving about the period of the barley-sowing, when its pecu-

liar note is heard from many a tree. It does not appear a shy bird with us; I have had frequent opportunities of observing it in my own grounds, and a pair built their nest for several successive years in the hollow of an old tree, which formed one of the ornaments to a rustic cottage in the grounds at Steephill, and which was by no means a secluded spot.

CERTHIADÆ. To this genus belong the Common Creeper, Wren, and Hoopoe.

1. Certhia familiaris. *The Common Creeper.*

Though abundant generally in the island, is not so common in this district.

2. Sylvia troglodytes. *The Wren.*

This restless little favourite is abundant.

3. Upupa epops. *The Hoopoe.*

Several well-authenticated instances of the occurrence of this singular bird in the Undercliff are recorded. Two specimens were obtained at Bonchurch some years since by Joseph Hadfield, Esq., and are now in the British Museum. In April, 1844, the Rev. C. A. Bury saw one about the same spot, but failed at the time to obtain possession of it. The bird, however, was shot the following morning. Various instances have occurred of its having been killed in other parts of the island.

CUCULIDÆ. The following well-known species belongs to this genus.

1. Cuculus canorus. *The Common Cuckoo.*

Abounds with us, and is more plentiful in some seasons than in others. This year (1848) it has been

more than usually numerous, and about the beginning of May I observed what I have never seen noticed in the history of this bird, namely, the flight of three of them together, followed at a short distance by a fourth; they were apparently flying in no very harmonious mood, making occasional "stoops" at each other, and uttering their peculiar note in all its varieties from merely the first syllable to the well-known full-toned *cuckoo*.

HALCYONIDÆ. The only British species belonging to this genus is the

1. Alcedo ispida. *The Kingfisher.*

This brilliant-plumed bird occasionally occurs in the Undercliff, and a pair was observed in 1844 frequenting the little lake of Bonchurch.

HIRUNDINIDÆ. The Swallow tribe.

1. Hirundo rustica. *The Swallow.*

Abounds with us during the summer; and solitary birds are occasionally seen at a very late period of the year. Two are reported to have remained in the neighbourhood of Ventnor, in 1842, as late as December 18th.

2. Hirundo urbica. *The Martin.*

This species breeds in our cliffs, and is numerous during the usual period of its visit.

3. Hirundo apus. *The Common Swift.*

Is seen in flocks at the time of its arrival, but does not breed in the district.

CAPRIMULGIDÆ. We possess the only British species belonging to this genus.

1. Caprimulgus Europeus. *The Night Jar.*

Is by no means uncommon with us; and individuals are frequently met with in the grounds at Steephill.

RASORES.

This comprises the third Order of birds, most of which obtain the greater part of their food upon the ground. The family of pigeons, which have by some ornithologists been placed among the Insessores, form, as it were, the connecting link between the two Orders.

Columbidæ. Under this genus is included the various species of Doves.

1. Columba palumbus. *The Ring Dove*, or *Wood Pigeon.*

Is very plentiful with us throughout the year.

2. Columba turtur. *The Turtle Dove.*

This plaintive bird is one of our summer visitors; and the following is an extract from a letter from the Rev. J. F. Dawson respecting it: "Before I left the island last June I called upon you for the purpose of mentioning that the turtle dove certainly *breeds* in the Undercliff."

Phasianidæ. The Pheasant Tribe.

1. Phasianus colchicus. *The Common Pheasant.*

This handsome bird was once abundant in the Undercliff; but, alas! for the sportsman, its numbers have sadly diminished; the poacher and the fox have

done their work, and the number of pheasants now found is inconsiderable.

An order was issued under the sign manual in the time of Henry VIII., addressed to Richard Worsley, Esq., Captain of the Isle of Wight, to prevent any pheasants or partridges being killed in the island. After reciting that it had been reported that the game had much decreased, by persons having been permitted to use "netts and other engyns" on the manors on the island, and strictly forbidding the practice to be continued, and directing the nets, &c., of parties so offending to be seized, and themselves punished, the order continues—"But also that you shall advise all the rest of the owners and inhabitants there at o^{r} contemplacon also to spare the same games in their owne grounds speally absteyning to take or suffre to be taken any fesant, patriche w^{h} netts and such engyns as totally destroyeth the brede of the same, wherein y^{u} shall doo unto us acceptable service."

2. Perdix cinerea. *The Common Partridge.*

Although the nature of our ground is not very favourable for harbouring the partridge, we can still boast of a few covies, but the bird cannot be said to be abundant.

GRALLATORES.

This forms the fourth Order, and may be regarded as commencing the last of the two great divisions, formerly adopted, of the Land and Water Birds. The

Grallatores, or Wading Birds, although not strictly Water Birds, may be considered as being the connecting link between them and the Land Birds.

CHARADRIADÆ. This is the first genus of the Order, and includes the plovers.

1. Charadrius pluvialis. *The Golden Plover.*

Occasionally visits us during severe weather.

2. Charadrius hiaticula. *The Ringed Plover.*

Small flocks of this bird have been sometimes observed in this district, and it is said, upon good authority, to breed in the neighbourhood of Yarmouth.

3. Tringa vanellus. *The Peewit,* or *Lapwing.*

Breeds in the island; but is only an occasional visitor in the Undercliff.

4. Tringa interpres. *The Turnstone.*

Is rare with us.

5. Hæmatopus ostralegus. *The Oyster Catcher.*

This bird is also of rare occurrence on our coast.

ARDEIDÆ. This genus contains the—

1. Ardea stellaris. *Common Bittern.*

A specimen of this bird was obtained at St. Lawrence, in 1840; and I recollect seeing a bittern, about the same period, which had been picked up dead on the coast, having apparently been washed on shore.

SCOLOPACIDÆ. To this genus belongs the family of curlews, snipes, &c., of which the Undercliff lays claim to several species.

1. Numenius phœopus. *The Whimbrel.*

Although by no means uncommon about Sandown, this bird is only occasionally met with here.

2. Tringa hypoleucos. *The Common Sandpiper*, or *Summer Snipe.*

Usually makes its appearance on our shores about the end of April, and is not unfrequent.

3. Scolopax ægocephala. *The Bar-tailed Godwit.*

Has been sometimes obtained in this district.

4. Scolopax rusticola. *The Woodcock.*

Is by no means an unfrequent visitor in the Undercliff, and is ascertained beyond a doubt to breed in the island.

5. Scolopax gallinago. *The Common Snipe.*

Is occasionally found, during the winter, in those parts of the district suited to their habits.

6. Scolopax gallinula. *The Jack Snipe.*

Also sometimes visits us during the winter season.

7. Tringa islandica. *The Knot.*

Has been obtained on the shore at Bonchurch.

8. Tringa alpina. *The Dunlin.*

This bird has also been killed in the same locality as the former species.

9. Tringa maritima. *The Purple Sandpiper.*

Occasionally visits our coast; and several specimens have been secured.

Rallidæ.—The Undercliff possesses but two species of this genus.

1. Gallinula crex. *The Land Rail.*

This species, although very abundant in some parts

of the island, is only occasionally found in this district, where, however, its presence has been ascertained so late as the latter end of October.

2. Rallus aquaticus. *The Water Rail.*

Is sometimes found with us in the winter, and is rather abundant in the island in those situations adapted to it.

3. Gallinula chloropus. *The Moorhen.*

Those who are fond of studying the habits of birds will find abundant opportunity in watching the peculiarities of a pair of this species, which I have observed to breed regularly, in the pond at Bonchurch, for these three or four years past.

NATATORES.

This is the fifth and last Order of birds, and consists of those which usually come under the denomination of water fowl. Although the island, and especially the western extremity, is more than usually rich in varied species, the Undercliff possesses but few, and the greater part of these are merely passing visitors. Of the first genus belonging to this order, the ANATIDÆ, or the tribe of swans, geese, and ducks, the island generally boasts of enumerating above twenty species; yet this district can only lay claim, with any certainty, to a solitary one, the

1. Anas nigra. *The Common Scoter.*

This bird is occasionally seen off our coast, and has been killed near Steephill.

COLYMBIDÆ. This genus comprises the Divers.

1. Colymbus glacialis. *The Great Northern Diver.*

Has been observed rarely near our shores, but has been killed in the neighbourhood.

2. Colymbus arcticus. *The Black-Throated Diver.*

A specimen of this bird has also been shot in the same locality as the preceding species, but it is not commonly seen with us.

3. Colymbus septentrionalis. *The Red-Throated Diver.*

Is much more frequent off our coast, and may indeed be said to be abundant. An individual of this species once came into my possession in a singular manner. In the latter end of April, 1839, some fishermen were following their occupation off Ventnor, about a mile or two from the shore, when they perceived something floating at a short distance, which they at first imagined to be a "tub." With all the eagerness and goût of old smugglers, they immediately pulled their boat towards it; when what was their surprise at seeing what appeared to be a bird having the tail and body of a fish! On a nearer approach, however, the mystery was solved; a bird, the "Colymbus septentrionalis," or Red-Throated Diver, was found firmly impacted in the serrated jaws of a "Lophius piscatorius," or "Devil fish!" Both were captured and drawn into the boat, and, after somē difficulty, the bird was released, perfectly uninjured, from its novel situation, and immediately commenced rewarding its liberators by attacking them with its pointed bill: the

fish, which was still alive and uninjured, except by the means used to free its prisoner, was also inclined to give battle, but was soon despatched. The most probable solution that can be given to this curious fact seems to be, that the Diver, in pursuit of its prey under water, was seized upon by the formidable jaws of the ferocious fish, and that, having its head at liberty, from the greater buoyancy of its body and feathers, it was enabled to drag its enemy to the surface (its own body being protected from injury by its downy armour), and there to retain it, until captured in the manner described. The bird was forwarded to the Zoological Gardens in the Regent's Park, and I believe lived a short time in one of the basins of water there. The fish is not unfrequent on our coast, and is sometimes exhibited to the wondering visitors by those who have been fortunate enough to make a capture.

ALCADÆ. To this genus belongs

1. Uria troile. *The Common Guillemot*, or *Willock*. Which is not uncommon throughout the year.

2. Alca arctica. *The Puffin.*

Breeds in the cliffs at Freshwater, and is occasionally seen off our coast.

3. Alca Torda. *The Razor Bill.*

Like the preceding species, breeds near the Needles, and sometimes visits us.

PELECANIDÆ. Under this genus is included—

1. Pelecanus carbo. *The Common Cormorant.*

Which also breeds on the Needles, and frequents our coast.

2. Pelecanus cristatus. *The Shag*, or *Green Cormorant.*

Is also one of our visitors, and breeds in the same locality as the foregoing species.

3. Pelecanus bassanus. *The Gannet*, or *Soland Goose.*

Occasionally visits us in winter.

Laridæ. This is the last genus of British birds, and comprises the tribe of Gulls.

1. Larus ridibundus. *The Black-headed Gull.*

Is sometimes common during the winter.

2. Larus tridactylus. *The Kittiwake Gull.*

Is also frequent throughout the winter.

3. Larus canus. *The Common Gull.*

Likewise visits us at the same season.

4. Larus fuscus. *The Lesser Black-backed Gull.*

Abounds during the winter months.

5. Larus argentatus. *The Herring Gull.*

Is plentiful with us, and breeds both at Freshwater and Culver Cliffs.

6. Larus marinus. *The Great Black-backed Gull.*

Has been now and then observed off our coast.

With this terminates my notice of the Ornithology of this interesting district. I am far from imagining that it includes all the species that may be occasionally found in the Undercliff; indeed I am inclined to believe that other, and probably rare and interesting specimens, of migratory birds especially, may some-

times be met with in this locality; and I would call the attention of those fond of ornithological pursuits, who may visit the Undercliff, to the subject.

REPTILIA.

Happily our British Fauna contains but few species of any of the genera belonging to this order. I say happily, because, in the favoured clime of Britain, we neither fear the presence of the fatal Rattlesnake in our woodland rambles, nor does the equally deadly Cobra di capella invade our dwellings. I cannot even now call to mind, without a shudder, the circumstance of having once dined in a room in India, in which one of the latter most poisonous species lay concealed under the carpet of rattan during the whole of our repast, and reflecting how small a space existed between the hilarity of the convivial board and certain destruction; or forget, that a near relation, in the same country, once found her sleeping infant, I may almost say in the folds of this mortal reptile.

SQUAMATA (SAURIA).

This is the first Order which comes under our notice as belonging to the Undercliff, and contains the genus

LACERTIDÆ, or Lizard tribe; of which, I fear, we can only lay claim to one species.

1. Zootoca vivipara. *The Viviparous* or *Common Lizard.*

This agile little animal is very frequent on all our

dry banks; but its activity is such, that it requires no little dexterity in capturing it. The beautiful species, Lacerta Agilis, or *Sand Lizard*, I have sought for in vain, although it occurs on the opposite coast of Dorsetshire. The Green Jersey Lizard, Lacerta viridis (?), I have endeavoured to introduce; and, for this purpose, brought a number of individuals of the species from Jersey, in 1841, and turned them loose on a spot where they were not likely to be disturbed, and very similar to that from which they were taken. The experiment, however, failed. I thought once afterwards I saw one of these beautiful creatures, but no trace of them has been since discovered.

SQUAMATA (SAUROPHIDIA).

ANGUIDÆ. To this genus belongs the—

1. Anguis fragilis. *Blind* or *Slow Worm.*

This harmless creature abounds with us, and expiates, too frequently, at the hands of the vulgar, the noxious qualities possessed by the viper. That they will endeavour to use their tiny teeth as a means of defence against capture, I can, from frequent experience, vouch; but they are incapable even of piercing the skin with such inefficient weapons.

It was long before I could induce my gardener to believe they were serviceable to him: an opportunity, however, offered itself in the summer of 1847, of enforcing my reasoning by fact. I discovered a large slow-worm in my garden, with a portion of a *black* slug

protruding from its jaws; and, calling my man's attention, we released it, or rather the remains of it. A portion (the head) was already destroyed and swallowed, and that part still held in the mouth was reduced to a sort of gelatinous pulp, while the remainder was untouched. Upon relieving the slow-worm from his half-finished meal, he glided, or rather wriggled, rapidly away, most willing, probably, to regain his liberty at the expense of a repast which had sadly impeded his efforts to escape.

I find cats are extremely fond of preying upon this reptile; one, belonging to a friend and neighbour, is continually hunting my banks in search of them; and this is by no means a solitary instance.

SQUAMATA (OPHIDIA).

Under this Order is the

COLUBRIDÆ. To this genus belongs

1. Natrix torquata. *The Ringed* or *Common Snake*, the only species.

This is the most elegant and beautiful of our reptiles; and its perfectly harmless character would render it an object of admiration, could we divest our minds of the abhorrence implanted in us by nature to all the tribe. Though not unfrequent, the snake is not very common in the Undercliff, although some very fine specimens are occasionally met with.

VIPERIDÆ. This genus contains the only poisonous species of British Reptilia, and possesses but one species, to which, however, may be appended two varieties.

1. Pelius Berus. *The Common Viper*, or *Adder*.

This species used to be found rather abundantly in the Undercliff a few years back; yet the advance of building, and consequent habitation, have tended much to lessen its numbers; and the naturalist who may wish to possess specimens of the viper must now seek them in the more retired and secluded spots.

The first variety of this species which we find in this district is the

2. (Vipera communis, var. β of Mr. Jenyns.)

I have had several specimens of the Red Viper in my possession; but with none of them could I succeed in prolonging their existence by inducing them to take food while in confinement; they have universally died, greatly attenuated from inanition. I am therefore unable to advance any opinion, founded on personal observation, whether this particular reptile deserves to be described as a variety, or whether it is merely a form of the young of the common viper, as suggested by the Rev. C. A. Bury, in his paper in the "Zoologist" for 1845, p. 1032.

3. (Var. δ of Jenyns.)

I have seen several specimens of this species taken in this district; and one of the largest I have met with was killed in my garden a few years since. I forget the exact measure, but its length was considerable, and it was of a fine black colour, on which the usual markings were only perceptible by being of a darker shade when viewed in particular lights; the belly was of a leaden hue.

AMPHIBIA.

This connecting link between the true reptiles and fishes has but few representatives in this district. The first Order is the

ANOURA,

which contains the genera of frogs and toads.

RANIDÆ. This comprises the different species of frogs.

1. Rana Temporaria. *The Common Frog.*

The Undercliff possesses but few specimens of this usually common species; the absence of marshy ground, or stagnant pools, will probably in a great measure account for the deficiency.

A rumour exists that the *Tree* frog was known to occur on the large trees about Wrong's Farm, near St. Lawrence, in the Undercliff; and the description given of the animal, and its musical qualities, was certainly strange. The person who communicated the intelligence to the late R. Loe, the village-naturalist of Newchurch, was very particular in his description, and used to assert that there was no other place in the kingdom in which these creatures were known. It is not improbable that they were at some former period imported into the district, and had become partially naturalized; as, probably, may have been specimens of the edible frog, believed by the Rev. C. A. Bury to have occurred.

BUFONIDÆ. This is the second and last genus of the order.

1. Bufo vulgaris. *The Common Toad.*

Occurs in considerable numbers, and of large size, with us. I have only been able to ascertain the existence of one species, but I think the occurrence of the Bufo calamita, or Natter-jack toad, by no means improbable; and I am confirmed in this idea by some recollection of having myself found an example of this species.

URODELA.

This Order contains the Newts, or Salamandridæ, which genus includes the following species met with in the Undercliff.

1. Lissotriton punctatus. *Common Smooth Newt, Eft,* or *Evet.*

This species, as well as the succeeding, is tolerably common (?).

2. Lissotriton palmipes. *Palmated Smooth Newt.*

Is not uncommon (?).

ICHTHYOLOGY,

OR FISHES OF THE UNDERCLIFF.

The next section which our subject embraces is the history of the fishes found off our coasts, and near our shores; and although I hope to offer a list not wholly without interest, yet my opportunities have been so few, and the difficulty of obtaining specimens and information so uncertain and great, that I am compelled to submit a far less satisfactory account to the reader than I had at one time anticipated.

Until within the past twelvemonth I had studied the

fishes frequenting our coasts in a desultory manner, my attention being particularly directed to the subject only when any rare or interesting species was brought under my notice; and, during the past few months, when I had used all the means at my command to verify, by personal investigation, the lists with which I had been supplied, the unfavourable state of the season has prevented my pursuing the subject so satisfactorily as I had hoped to have done.

My friend, Edmund Peel, Esq., of Bonchurch, has been kind enough, however, to furnish me with a catalogue of those species for whose occurrence he can vouch; and the long residence of that gentleman in the vicinity has afforded him opportunities for extensive observation, to which his natural tastes have stimulated him. I am also greatly indebted to the distinguished author of "British Fishes," Wm. Yarrell, Esq., V.P.Z.S., for the personal assistance he has so kindly afforded me in my researches, as well as to his valuable work, without which I should have failed collecting even the few materials I have been enabled to bring together. I purpose following his arrangement, and commence with the first order.

ACANTHOPTERYGII,

or fishes with some of their fin-rays spinous, the others flexible. This Order contains several families.

I. PERCIDÆ, or the Perches, of which two known species alone are found.

1. Labrax Lupus. *Basse*, or *Sea Perch.*

Is sometimes taken of very large size, and has been known to weigh as much as 16 lbs. and 18 lbs.

2. Mullus Surmuletus. *Striped Red Mullet.*

Has been captured off Steephill.

I think it most probable that the Trachinus Vipera, *Sting Fish*, or *Lesser Weever*, inhabits our coasts, but I have not been able to meet with it; and the accounts of its existence hardly warrant an insertion here.

II. Trigla. The Gurnards.

1. Trigla Cuculus. *The Red Gurnard*, or *Cuckoo Gurnard.*

Is not uncommon.

2. Trigla Lineata. *The Streaked Gurnard, French Gurnard*, or *Rock Gurnard.*

Is said to be frequently taken.

3. Trigla Gurnardus. *The Grey Gurnard.*

Is also not unfrequent.

III. Cottus. The Bull-heads.

1. Cottus Gobio. *The River Bull-head*, or *Miller's Thumb.*

Several specimens of this fish were obtained by my friend George Guyon, Esq., a few years ago, from under stones in the little stream which runs into the lake at Bonchurch.

2. Cottus Scorpius. *Sea Scorpion*, or *Short-spined Cottus.*

One of this species was brought to me during the past summer.

3. Cottus Bubalis. *Father Lasher*, or *Long-spined Cottus.*

Is very common. The tenacity of life of this fish is well known to naturalists; and I witnessed an instance of one which was caught while angling in a pool at Alverston, Isle of Wight (at some distance from the sea), which exhibited signs of life after having been in a basket for a period of at least five hours, and which perfectly revived on being placed in water, and was restored to liberty two days afterwards, in a little rivulet near Steephill.

IV. Gasterosteus. The Sticklebacks.

1. Gasterosteus Trachurus. *The Rough-tailed Stickleback.*

Is found in some of our little streams, but I am not aware of the existence of the two nearly allied species, G. Semiarmatus, and G. Leiurus.

2. Gasterosteus Spinachia. *The Fifteen-spined Stickleback.*

Is sometimes taken on the rocky parts of our coast.

V. Sparidæ. This includes the

1. Sparus Centrodontus. *The Sea Bream.*

Which is now and then caught off the coast. One was taken off St. Lawrence during the past summer (1848).

VI. Scomberidæ. The family of the Mackerel.

1. Scomber Scomber. *The Mackerel.*

This fish abounds on our coast during the later part of spring and early summer, and at a more advanced

period of the season they are sometimes taken with the seine net in very large quantities in Chale Bay. In fine, calm, summer weather, sculls or shoals of this fish may be seen here and there ruffling the surface of the sea, and their appearance in this manner is said to prognosticate a continuance of fine weather.

2. Caranx Trachurus. *The Scad,* or *Horse Mackerel.*

Is said to belong to our waters, and, from the occurrence of the species in the Channel to the eastward and westward, I have no reason to doubt the assertion.

3. Zeus Faber. *The Doree,* or *John Dory.*

Cannot be uncommon off our coast, as, besides small specimens being frequently taken near the shore, I had a fine one brought me about five years since, which was caught by hand close on the beach.

VII. Mugilidæ.

1. Mugil Capito. *The Grey Mullet.*

Is occasionally taken in Mill Bay, with the seine net, in some quantity; and the fry of this fish are also caught in the little bays along the coast.

2. Atherina Presbyter. *The Atherine,* or *Sand Smelt.*

This beautiful little fish, which is caught in abundance at Portsmouth and Southampton, is also met with here, but the absence of anything like a harbour probably prevents its being taken more frequently. It is a delicate fish, and excellent eating, and, though not so good as the true smelt, forms an admirable substitute.

VIII. Gobioidæ. The family of the Gobies.

1. Blennius Gattorugine. *The Gattoruginous Blenny,* or *Cull* (Isle of Wight).

A specimen of this fish was first brought me in July, and I preserved it alive in a pan of daily renewed sea-water until the end of September, when, from being exposed to very heavy rain during the night, the salt water became so diluted with fresh, as to render it unfit for the purposes of life, and my captive died. During the period I had it in my possession, the fish fed freely on small earthworms; it at first evinced considerable ferocity, and darted at the finger or anything that was thrust into the water, but it afterwards became much more reconciled, and would hide itself under some seaweed, which was placed for the purpose, the head alone being seen. Its motions were very rapid, and the eye was constantly directed to any spot which indicated the approach of a stranger; this quick motion of the eyes was very singular, and gave the animal quite a look of intelligence. The lower portion of the pupil was apparently composed of an opaque white substance; and the fish itself, when sickly, or in want of a fresh supply of water, would lose its dark colour and become almost white. Although the fimbriated appendages with which the head is furnished are apparently under little or no control of the fish, when out of water, yet it seemed as if it had the power of thrusting them forward on any occasion of alarm. It was very impatient of the company of other fish, and exhibited much uneasiness when the vessel in which it was confined was made to hold dif-

ferent species, and, if they were not speedily removed, would begin to droop. I have since had several specimens brought to me; they are usually taken in the crab-pots, and are consequently fish belonging to deep water.

2. Blennius pholis. *The Shanny*, or *Smooth Shan.*

This fish is very common on our shores.

3. Murænoides guttata. *The Spotted Gunnel,* or *Butter Fish.*

This fish is also very common in the little pools left by the receding tide among the rocks.

4. Gobius bipunctatus. *The Double-spotted Goby.*

Two specimens were brought me last August, which were caught off Ventnor, measuring from 2 inches to $2\frac{1}{4}$.

5. Gobius minutus. *The Spotted Goby.*

Is plentiful in our sandy coves.

IX. Lophius.

1. Lophius piscatorius. *The Fishing Frog, Angler, Sea Devil,* or *Devil Fish.*

This hideous creature is of frequent occurrence off our coast, and I have already alluded, in the history of the birds of the district, when mentioning the Colymbus septentrionalis, or *Red-throated Diver*, to the extraordinary manner in which an individual of this species was obtained. This fish itself would appear to become the prey of some of the larger species of dog-fish, as I have in my possession a partially digested under-jaw of the lophius, which was taken from the stomach of a dog-fish, the particular species of which I was unable to ascertain.

X. Labridæ. Family of the Wrasses or Rock-Fishes.

From the nature of our coast, we may naturally be supposed to possess most of the beautiful species belonging to this family; and I have been able to identify the following.

1. Labrus maculatus. *The Ballan Wrasse.*

This fish, which is remarkable for the variety and brilliancy of its colour, is very frequent near our shores, and is continually caught in the crab-pots.

2. Labrus lineatus (L. psittacus. Risso). *The Green-streaked Wrasse.*

A specimen was brought me last July, which agreed perfectly in all its characters with those of M. Risso, given by Yarrell; and, as I have never met with a similar one among the numerous species of Labri brought to me, I am inclined to hope I may be correct in believing this rare fish is sometimes taken on our coast.

3. Crenilabrus tinca. *Gilt Head, Gilt Maid,* or *Connor.*

Is one of the most common of this tribe, and is constantly found in the crab pots.

4. Crenilabrus Cornubicus. *Goldfinny,* or *Goldsinny.*

Mr. Peel's catalogue contains the name of this fish, which is known to the fishermen under the name of Goldfinny: I have not been fortunate enough to meet with a specimen.

5. Crenilabrus rupestris. *Jago's Goldsinny.*

A fine example of this beautiful fish was obtained for me last September, having been taken in a crab pot off Niton: it was sent with other fish to Mr. Yarrell.

With this closes our notice of the Acanthopterygii, and we now proceed to enumerate the various families and species which we are known to possess, included in the order,

MALACOPTERYGII.

Soft-skinned fishes: the fin rays almost universally flexible. The first family belonging to it is the

I. Cyprinidæ, or family of the Carp.

1. Cyprinus Carpio. *Common Carp.*

This species occurs in the little lake at Bonchurch, and also at Old Park, having of course been introduced at both places.

2. Cyprinus auratus. *The Gold Carp*, or *Gold* and *Silver Fish.*

This species ought, perhaps, hardly to be inserted here; but, as Yarrell has admitted it, I thought I might make the observation that a number of these beautiful fish have been introduced into the basins formed by a spring at Bonchurch, and appear to thrive well.

3. Leusiscus rutilus. *The Roach.*

Was at one time extremely abundant in the lake at Bonchurch; but, when that was last cleaned out, the greater number of the fish it contained were destroyed.

II. Esocidæ, or Family of the Pikes.

The Undercliff possesses no fresh-water stream or lake large enough to harbour the voracious fish (the

Pike) which gives the name to the family; and we therefore proceed to notice the only species which we can lay claim to, viz.—

1. Belone vulgaris. *The Garfish, Sea Pike, Mackerel-Guide, Green-bone, Long-nose, Gorebill, Horn-fish,* or *Sea Needle.*

By all of which names it is known, is not unfrequently taken off the coast.

III. Salmonidæ. The family of the Salmon or Trout.

1. Salmo salar. *The Salmon.*

Mr. Peel informs me that he has eaten Salmon Peal (the young of the Salmon, when they are under two pounds' weight, are known by this name), which was caught off Bonchurch, where the little stream there falls into the sea; and, when we consider the occurrence of this fish in the neighbouring waters of Southampton and Christchurch, &c., their capture off this coast does not appear at all unlikely.

IV. Clupeidæ. The family of the Herrings.

1. Clupea harengus. *The Herring.*

Is taken off our coast during the proper season in large quantities by the Brighton and Hastings fishing-boats.

2. Clupea Sprattus. *The Sprat,* called here *Herring Sprat.*

Is also caught off our shore.

3. Alosa communis. *The Allice Shad* (?).

This fish, of which the Whitebait is said to be the young, is noticed here from being contained in Mr.

Peel's list; but I have had no means of verifying the occurrence of a species, which, except in the Severn, is rarely met with.

MALACOPTERYGII SUBBRACHIATI.

This is a division of the last Order, and the various species contained in it are characterized by ventral fins attached under the pectorals. The first family to be noticed is,

I. GADIDÆ. The family of the Cod Fish.

1. Morrhua vulgaris. *The Common Cod,* or *Keeling.*

This species is frequently taken on the lines laid down at sea by the fishermen called "trots," and sometimes of a tolerable size. The flesh, however, is rarely of so good a quality or so firm as that of cod caught more to the westward. The late Earl of Yarborough, while cruising in his yacht a few years since off the Undercliff, believed he had discovered a cod-bank at some distance from the shore, but he failed afterwards to establish the spot.

I am not aware of the Morrhua Æglefinus, *the Haddock,* having been taken off the coast; but I have little doubt of its existence in our waters.

2. Morrhua lusca. *The Bib, Pout,* or *Whiting Pout.*

Occurs in abundance off our shores, and its capture affords much amusement to amateur fishermen.

3. Merlangus vulgaris. *The Whiting.*

Is occasionally caught, and is of most delicious flavour.

4. Merlangus pollachius. *The Pollack, Whiting Pollack,* or *Whiting Cole.*

This fish is taken in great quantities, and, like the Pout, affords much sport.

5. Merlucius vulgaris. *The Hake.*

Is said by our fishermen to be sometimes caught off the back of the island. Portsmouth receives large quantities, which are, I believe, principally brought from the south-western coast.

6. Motella vulgaris. *The Three-bearded Rockling,* or *Redbeard* (I. Wight).

Is frequent on our rocky shores. A very fine specimen was brought me last August, which was caught off Bonchurch. The fish is a handsome one; but the unpleasant smell which it emits a short time after its capture, renders it too disagreeable to be used for food.

7. Motella quinquecirrata. *Five-bearded Rockling.*

I have met with far more numerous specimens of this fish than of the preceding species; and their presence amongst a number of other fishes may readily be distinguished by the same offensive odour as that just mentioned.

II. Pleuronectidæ. The family of the Flounders, or Flatfish.

1. Platessa vulgaris. *The Plaice.*

Is common with us.

2. Platessa flesus. *The Flounder,* or *Fleuk.*

Is also frequent with us.

3. Platessa limanda. *The Common Dab.*

Is caught off our coast with the two before mentioned species.

4. Rhombus maximus. *The Turbot.*

This fish is contained in Mr. Peel's Catalogue; but I have not seen one which has been taken off our coast, though there is no reason to doubt its occurrence.

5. Rhombus vulgaris. *The Brill.*

Is not unfrequently met with.

6. Solea vulgaris. *The Sole.*

Is frequently met with, but usually of a small size.

III. Cyclopteridæ. The family of Sucking Fishes.

1. Cyclopterus Lumpus. *The Lump Sucker, Sea Owl,* or *Lump Fish.*

Is sometimes met with near the shore.

The next division in the Order we are now considering, is distinguished by the denomination of

MALACOPTERYGII APODES.

I. Murænidæ. The family of the Eel-shaped Fishes.

1. Anguilla acutirostris. *Sharp-nosed Eel.*

Many specimens of this species have been brought me during the past summer, having been taken in the sea close to the shore; they rarely measured more than from six or seven inches to a foot in length, and are met with occasionally, I understand, in great abundance.

2. Conger vulgaris. *The Conger.*

This fish is taken in plenty off our shores, and sometimes of a very large size; and from its great power proves a formidable antagonist, when drawn into the boat.

3. Ammodytes Lancea. *Sand Launce*, or *Sand Eel.*

I have verified the occurrence of this species on the coast of the Undercliff, and I have little doubt but that both species of Ammodytes may be found here. The fish is very abundant in Sandown Bay, and forms an excellent dish at table.

Before closing this notice of the Murænidæ, I may allude to the probability of the occurrence of the Leptocephalus Morrisii, *The Anglesey Morris*, on our shores.

Mr. Peel, while strolling with his friend, Mr. Tennyson, along the beach near Black Gang, had his attention directed to a small semitransparent, silvery looking little fish lying amongst some sea-weed; he took it up and carefully examined it, and, after admiring its beauty (having at that time no object in retaining it), transferred it to its native element, and thus lost me the opportunity of recording it as a *certain* species in the Fauna of the Undercliff. Mr. Peel is confirmed in the idea of the identity of this fish, by a reference to *that* figured and described in Yarrell's British Fishes, Vol. II., p. 311, 1st Edition, and the only species with which it might be con-

founded is that of the Lancelet, p. 468, *op. idem*, which is of less likely occurrence.

LOPHOBRANCHII.

This Order of fishes is distinguished by having their gills separated into small rounded tufts, which are arranged along the branchial arches.

I. SYNGNATHIDÆ. The family of the Pipe Fishes.

1. Syngnathus Acus. *Great Pipe Fish.*

This species frequently occurs.

2. Syngnathus lumbriciformis. *The Worm Pipe Fish.*

This curious little fish is not uncommon with us. I met with one, which I forwarded to Mr. Yarrell, having the ova attached to the under and external surface of the abdomen.

I had another species of this family brought to me during this summer, but I neglected to take a note of it at the time, and am uncertain as to its name.

PLECTOGNATHI,

Or that Order of fishes distinguished by certain peculiarities of the bones of the cheeks.

I. GYMNODONTIDÆ.

1. Orthagoriscus Mola. *Short Sun Fish.*

A specimen of this animal was taken about a mile and a half at sea, off Bonchurch, June 29th, 1841. It was discovered swimming, or lying on its side on the surface of the water, flapping its fins occasionally;

it was hooked with a gaff, and made great resistance, and took an hour to secure. Its extreme length was 4 feet 7 inches, and it measured in depth 2 feet 7 inches from the back to the belly: the distance between the extreme points of the dorsal and anal fins was six feet within an inch. It weighed 337 lbs.

There are notices in some early books on the island of the occurrence of this fish off our shores; and I think I remember to have heard of another capture within these ten years besides the one above alluded to.

CHONDROPTERYGII.

This is the last Order; and the first family in it is that of the

I. SQUALIDÆ. The family of the Sharks.

1. Scyllium canicula. *The Small Spotted Dog Fish*, or *Nurse* (I. Wight).

This, and the following species are commonly taken by lines set for the purpose, and are used as bait for the crab pots.

2. Scyllium catulus. *The Large Spotted Dog Fish.*

Is taken as I have just mentioned.

3. Carcharias vulpes. *The Fox Shark, Sea Fox*, or *Thresher.*

Is said to have been seen off the coast; but I am not aware of its ever having been captured.

4. Carcharias glaucus. *The Blue Shark.*

A fish of this species was captured on the 11th June, 1840, off Ventnor. It was taken in the same manner as it usually is; namely, by having become entangled

in the mackerel nets of the fishermen, to which this species is very destructive. It measured six feet and a half in length.

5. Lamna Cornubica. *The Porbeagle.*

A small shoal of these fishes is usually seen passing along the coast during the autumn; and in 1847 one or more was captured off Bonchurch by a party who went in pursuit of them, and thus identified the species.

6. Squalus griseus. *The Grey Shark.*

A specimen of this shark (a female), which is new to Britain, was brought to my door 15th November, 1845, having been taken off Dunnose-Point, about four miles from the land, with a night line, set at the bottom of the sea for the purpose of taking cod-fish, skate, &c. It offered no resistance while being drawn to the surface of the water, and was there secured with a gaff hook, and afterwards with a rope, by which it was towed on shore. It measured nearly 11 feet in length. This species is a native of the Mediterranean Sea, and abounds about the coasts of Sicily. It is the Squalus griseus of Linnæus, and the Hexanchus of Müller and Henlé; Cuvier includes it under the genus Notidanus. The animal here alluded to was presented to the British Museum by Captain C. H. Swinburne, R.N., who most kindly furnished me with an accurate outline sketch.

It may here be mentioned, that a young fish of this species was caught off the coast of Cornwall within a few days of that just mentioned, which, being a female, renders it most probable that it was one of the same

family. The small one is in the possession of Mr. Yarrell.

7. Galeus vulgaris. *The Common Tope,* or *Penny Dog.*

Is frequently taken with the "trot" line off the coast.

8. Mustelus lævis. *The Smooth Hound.*

This species is also occasionally caught in the same manner as the last.

9. Spinax acanthias. *The Picked Dog Fish,* or *Bone Dog.*

Is also frequent off our shores.

10. Squatina angelus. *The Angel Fish, Monk Fish,* or *Shark Ray.*

I have never seen a specimen of this fish, but I am assured, by those upon whose authority I can depend, that it is not unfrequent with us.

II. Raiidæ. The family of the Rays, or Skate.

1. Raia chagrinea. *Long-nosed Skate,* or *Shagreen Ray.*

This, as well as most of the following examples, is inserted on the authority of our local fishermen, who catch various species of this family with "trots" or lines, for the purpose of procuring bait for their crab pots.

2. Raia oxyrhynchus. *The sharp-nosed Ray,* or *White Skate.*

Is said to occur on our coast.

3. Raia clavata. *The Thornback.*

Is common with us.

4. Trygon pastinaca. *The Sting Ray.*

This species, I am assured, is occasionally met with, and the peculiar bony process in the tail of the fish would quite distinguish it from any other species for which it would be liable to be mistaken.

I am indebted to my friends, the Rev. J. F. Dawson and George Guyon, Esq., for the following list of the more striking species of the

COLEOPTERA,

Or Beetles of the Undercliff.

GEODEPHAGA.

Cicendela germanica. Local. Black Gang.

Drypta emarginata. Rare. This species had not been taken since 1815, until discovered by Rev. J. F. Dawson, at Luccombe, in 1845.

Dromius sigma (bipennifer Bab.). Beach, Ventnor.

Brachinus crepitans. Under stones, Ventnor.

———— explodens. Rare.

Dyschirius politus. Luccombe.

———— æneus. Luccombe.

Trimorphus humeralis. Scarce. Moss, Shanklin.

Anchomenus oblongus. Luccombe.

Sphodrus leucophthalmus.

Pristonychus Terricola.

Agonum marginatum. Whitwell.

Argutor longicollis. Damp places.

Adelosia picea. Under stones, Ventnor.
Amara similata.
Amara plebeia. Roads, Ventnor.
Harpalus semiviolaceus. Scarce. Under stones, Ventnor.
——— rubripes. Under stones, Ventnor.
——— limbatus.
Ophonus obscurus. Under stones, Ventnor.
——— azureus. Local. Ventnor.
——— puncticollis. Ventnor.
——— punctatissimus. Ventnor.
——— nitidulus. Scarce. Ventnor.
Stenolophus Skrimshiranus. Rare. Castle Cove.
Trechus flavicollis. Very rare. Of this insect only two specimens had been taken in England, until it was discovered at Luccombe by Rev. J. F. Dawson, 1846.
——— Harpalinus Dej. Luccombe.
——— fulvus. Luccombe.
——— similis, Erich. Moss, St. Boniface Down.
Blemus * *pallidus*, Steph. Rare. Beach, Ventnor.
Aëpus fulvescens. Scarce. Ventnor.
Lymnæum nigropiceum. Beach, Ventnor. This species was discovered by Rev. J. F. Dawson in 1845, only five specimens existed previously in collections. With the exception of a specimen reported to have been captured recently in Southern Russia, it is exclusively a British insect.
Tachys bistriatus. Rare. Luccombe.

* This species, which was supposed to be the B. pallidus of Sturm, appears to be a new one, and has not yet been named.

Ocys currens. Rare. Luccombe (?).
Notiophilus palustris. Luccombe.

PHILHYDRIDA.

Georyssus pygmæus. Luccombe.
Chætarthria Seminulum.
Leiodes dentipes.
——— Gyllenhalii.
——— multistriata.
——— testacea.
Agathidium Globus.
——————— Seminulum.
Clambus Enshamensis. Scarce. Luccombe.
Corylophus cassidoides. Scarce.
Orthoperus Punctum. Scarce.

NECROPHAGA.

Mylæchus brunneus. Rare. Luccombe.
Strongylus strigatus.
Micropeplus staphylinoides. St. Lawrence.

HELOCERA.

Limnichus sericeus. Rare. Sandy places.
Oömorphus concolor. Pelham Wood, Ventnor.
Simplocaria semistriata.
Hister bimaculatus. Scarce.
——— 12 striatus. Ventnor.

LAMELLICORNES.

Onthophagus cœnobita. Paths, Ventnor.
——————— ovatus. Ventnor.

MALACODERMA.

Dasytes viridis. Flowers, Ventnor.
Ochina ptinoides. Pelham Woods, Ventnor.

RHYNCOPHORA.

Tomicus bidens. In dead clematis, Ventnor.
Mecinus circulatus. Rare. Cliff, Ventnor.
Gymnaëtron pascuorum. Ventnor.
———— tricolor. Cliff, Ventnor.
Orobitis cyaneus. Pelham Wood, Black Gang.
Nedyus Sysimbrii. Watercress, Ventnor.
——— Chrysanthemi. Pelham Wood.
—— rugulosus.
——— Asperifoliarum. Pelham Wood.
Mononychus Pseudacori. Pods of iris fœtidissimus.
Sibinia Arenariæ. Rare. Black Gang Chine.
Grypidius Equiseti. On marestail, Shanklin.
Styphlus setiger. Rare. Ventnor, St. Lawrence.
Otiorhynchus Ligustici. Rare. Luccombe.
Trachyphlæus tesselatus.
———— scabriculus.
Cleonus sulcirostris. Luccombe.
Rhinocyllus latirostris. On thistles.
Apion Hookeri. Scarce. Pelham Wood.
——— Sorbi. Rare. Pelham Wood.
Ramphus pulicarius. Pelham Wood.

CYCLICA.

Haltica antennata. On reseda lutea, Ventnor.
——— consobrina. Ventnor. This species was unique

in Mr. Curtis's collection until discovered here in abundance by Rev. J. F. Dawson.

Haltica atrocærulea. Pelham Wood, Ventnor.
——— herbigradus. Grassy places, Ventnor.
——— fuscipes. Mallows, Ventnor.
——— ærata. Pelham Wood, &c.
Thyamis flavicornis. Near Niton.
———– Ballotæ. On ballota nigra, Ventnor.
———– dorsalis. On Senecio Jacobæa, Ventnor.
Macrocnema Dulcamaræ. Ventnor.
——————— Spergulæ. On charlock, Ventnor.
——————— picina.
Mantura obtusata. On dwarf cistus, St. Boniface.
———- semiænea. Ventnor.
Apteropoda graminus. St. Lawrence.
Mniophila muscorum. Moss, Shanklin Copse.
Chrysomela Banksii. Under stones, Ventnor.
Helodes Beccabungæ. On Watercress, Ventnor.

PSEUDOTRIMERA.

Coccinella hieroglyphica.
———— reppensis. Black Gang Chine.
Scymnus 4. pustulatus. Under bark, Shanklin.
———– bipustulatus. Ventnor.
———– analis.

HETEROMERA.

Hypophlæus depressus.
Oncomera femorata. At Sugar, Ventnor.
Salpingus viridipennis. Rotton wood, Ventnor.

Salpingus planirostris.
Sphæriestis denticollis.
Anthicus Antherinus. Moss, Ventnor.
——— ater. Beach, Ventnor.
——— constrictus. Rare.
——— tibialis. Scarce. Beach below Steephill.
Megaladerus thoracicus. Moss, Shanklin.

BRACHELYTRA.

Pselaphus Herbstii. Moss, Ventnor.
Bryaxis fossulatus.
——— Juncorum.
Arcopagus puncticollis.
——— bulbifer.
Bythinus Curtisii. Moss, Shanklin Copse.
——— securiger. Moss, Shanklin Copse.
Acidota rufa. Ventnor.
Hesperophilus arenarius.
Bledius armatus.
Pæderus fuscipes.
Rugilus punctipennis.
Lathrobium elongatum.
Philonthus intermedius. Rare.
Quedius fulgidus.
——— frontalis.
Xanthobium linearis.
Lithocharis melanocephalus.
Remus sericeus.
Gabrius cinerascens.
Staphylinus æriceps.

Centroglossa attenuata.
Atemeles paradoxus. Ants' nest, Bonchurch.

The above list will be found to contain all but the most common species, such as are met with everywhere in Britain.

LEPIDOPTERA.

I am enabled, through the kindness of Mr. Maitland, late of Ventnor, to give the following list of BUTTERFLIES and MOTHS, which have been taken in the neighbourhood of Bonchurch, Ventnor, and Steephill.

PAPILIONES.

I. PAPILIONIDÆ.

1. Gonepteryx Rhamni . . . . Common.
2. Colias Edusa . . . . . Ditto.
3. ——— Hyale . . . . . Rare.
4. Pontia Brassicæ . . . . . Common.
5. ——— rapæ . . . . . Ditto.
6. ——— napi . . . . . Ditto.
7. Mancipium cardamimes . . . Ditto.

II. NYMPHALIDÆ.

1. Melitæa cinxia. This butterfly is very abundant in the Isle of Wight, but very rare in England generally. It is frequent in Guernsey.
2. Melitæa Euphrosyne . . . . Rare.
3. Argynnis aglaia . . . . . Common.
4. Vanessa urticæ . . . . . Ditto.

5. Vanessa Io . . . . . Common.
6. ——— atalanta . . . . . Ditto.
7. Cynthia cardui . . . . . Ditto.
8. Hipparchia ægeria . . . . Ditto.
9. ——————— megæra . . . . Ditto.
10. ——————— semele . . . . Ditto.
11. ——————— galathea . . . . Ditto.
12. ——————— tithonus . . . . Ditto.
13. ——————— janira . . . . . Ditto.
14. ——————— hyperanthus . . . Ditto.
15. ——————— pamphilus . . . Ditto.

III. Lycænidæ.

1. Thecla rubi . . . . . Common.
2. Lycæna phlæas . . . . . Ditto.
3. Polyommatus argiolus . . . Ditto.
4. ——————— alsus . . . . Ditto.
5. ——————— Corydon . . . Ditto.
6. ——————— Adonis . . . . Ditto.
7. ——————— alexis . . . . Ditto.
8. ——————— agestis . . . . Ditto.

IV. Hesperiidæ.

1. Thymele alveolus . . . . . Common.
2. ——————— tages . . . . . Ditto.
3. Pamphila sylvanus . . . . Ditto.

SPHINGINA.

I. Zygænidæ.

1. Anthrocera filipendulæ . . . Common.

II. Sphingidæ.

1. Smerinthus Populi . . . . Ditto.

2. Acherontia atropos . . . . . Rare.
3. Sphinx convolvuli . . . . . Ditto.
4. ——— ligustri . . . . . Common.
5. Deilephila livornica. This very rare Hawk Moth has been twice taken in this district.
6. Chœrocampa porcellus . . . Rare.

III. Sessiidæ.

1. Macroglossa stellatarum . . . Common.

IV. Trochiliidæ.

1. Trochilium ichneumoniformis . Rare.

BOMBYCINA.

I. Hepialidæ.

1. Hepialus lupulinus . . . . . Common.
2. ——— sylvinus . . . . . Ditto.
3. Cossus ligniperda . . . . . Rare.

II. Notodontidæ.

1. Pygæra bucephala . . . . . Common.
2. Cerura furcula . . . . . Rare.
3. ——— bifida . . . . . Ditto.
4. ——— vinula . . . . . Common.
5. Notodonta ziczac . . . . . Rare.
6. Lophopteryx camelina . . . Ditto.
7. Ptilodontis palpina . . . . Ditto.

III. Bombycidæ.

1. Saturnia pavonia . . . . . Common.
2. Lasiocampa rubi . . . . . Ditto.
3. ——— quercus . . . . Ditto.
4. Trichiura cratægi . . . . . Rare.
5. Eriogaster lanestris . . . . . Common.

6. Clisiocampa neustria . . . . Common.
7. Gastropacha quercifolia . . . Rare.

IV. Arctiidæ.

1. Dasychira pudibunda . . . . Rare.
2. Leucoma salicis . . . . . Ditto.
3. Porthesia chrysorrhæa . . . . Common.
4. Arctia caja . . . . . Rare.
5. ——— villica . . . . . Common.
6. Spilosoma menthrasti . . . . Rare.
7. ——————— lubricepeda . . . . Common.
8. Fumea pulla . . . . . Rare.
9. Nudaria mundana . . . . . Ditto.

NOCTUINA.

I. Lithosiidæ.

1. Callimorpha jacobæ . . . . Rare.
2. ——————— miniata . . . . Ditto.
3. Lithosia complana . . . . . Common.
4. ——— depressa . . . . . Rare.
5. Gnophria rubricollis . . . . Ditto.

II. Noctuidæ.

1. Triphæna orbona . . . . . Common.
2. ——— subsequa. Two specimens of this very rare species have been taken by Mr. Maitland near Ventnor.
3. ——— pronuba . . . . . Common.
4. ——— fimbria . . . . . Rare.
5. ——— interjecta . . . . . Common.
6. ——— anthina . . . . . Ditto.

7. Charæas nigra. This species is common with us, though rare in England: it occurs in Scotland.
8. Agrotis pascuea. This is a rare coast-species. Mr. Maitland, who has taken seven specimens of this moth in the Undercliff, believes it has never before been captured in England. There appears some doubt, however, about the species, and specimens have been sent to Paris to be named.
9. Agrotis lunigera . . . . . Rare.
10. ——— corticea . . . . . Common.
11. ——— saucia. About fifteen specimens of this rare species have been taken in this district. It is common in France.
12. ——— segetum . . . . . Common.
13. ——— suffusa . . . . . Ditto.
14. ——— puta . . . . . Ditto.
15. ——— nigricans . . . . . Ditto.
16. ——— exclamationis . . . Ditto.
17. ——— cinerea. Mr. Maitland has taken only one of this very rare species.
18. ——— obelisca. Five dozen of this rare species have been captured by Mr. Maitland in this vicinity.
19. Graphiphora cataleuca. One specimen has been taken here; I believe the only other one taken in England was found at Penwith in Cornwall. It is not unfrequent on Arthur's Seat, near Edinburgh.
20. ——————— brunnea . . . Rare.

21. Graphiphora triangulum . . Rare.
22. ——— baja . . . . . Ditto.
23. ——— festiva . . . . Ditto.
24. ——— nigrum . . . . Common.
25. ——— plecta . . . . Ditto.
26. ——— bella . . . . . Ditto.
27. Semiophora gothica . . . . Ditto.
28. Orthosia instabilis . . . . Ditto.
29. ——— gracilis . . . . . Rare.
30. ——— stabilis . . . . . Common.
31. ——— cruda . . . . . Ditto.
32. ——— pistacina . . . . . Ditto.
33. ——— lunosa . . . . . Ditto.
34. ——— lota . . . . . Ditto.
35. ——— upsilon . . . . . Rare.
36. Mythimna lithargyria . . . Common.
37. ——— conigera . . . . Ditto.
38. Grammesia trilinea . . . . Ditto.
39. Segetia xanthographa . . . Ditto.
40. Caradrina blanda . . . . . Ditto.
41. ——— cubicularis . . . Ditto.
42. ——— glareosa . . . . Ditto.
43. Glæa rubricosa . . . . . Ditto.
44 Mecoptera satellitia . . . . Rare.
45. Amphipyra pyramidea . . . Ditto.
46. Pyrophila tragopogonis . . . Common.
47. Xylina oculata . . . . . Rare.
48. ——— putris . . . . . Common.
49. Calocampa exoleta . . . . Rare.
50. ——— vetusta . . . . Ditto.

51. Xylophasia lithoxylea . . . Common.
52. ——————— sublustris . . . Ditto.
53. ——————— polyodon . . . Ditto.
54. ——————— rurea . . . . . Rare.
55. ——————— characterea . . . Ditto.
56. Hadena adusta . . . . . Ditto.
57. ——— genistæ. This is usually a rare species, but is abundant here.
58. ——— plebeia . . . . . Common.
59. ——— lithoriza . . . . . Ditto.
60. ——— cucubali . . . . . Rare.
61. ——— capsincola . . . . Ditto.
62. ——— protea . . . . . Ditto.
63. ——— saponariæ . . . . Ditto.
64. Mamestra pisi . . . . . Ditto.
65. ——————— oleracea . . . . Common.
66. ——————— brassicæ . . . . Ditto.
67. ——————— cheriopodii . . . Ditto.
68. ——————— persicariæ . . . Ditto.
69. Euplexia lucipara . . . . Ditto.
70. Hama basilinea . . . . . Rare.
71. ——— testacea . . . . . Ditto.
72. ——— infesta . . . . . Common.
73. Apamea oculea . . . . . Ditto.
74. Miana suffuruncula . . . . Ditto.
75. ——— strigilis . . . . . Ditto.
76. ——— humeralis . . . . . Ditto.
77. Miselia oxyacanthæ . . . . Ditto.
78. ——— conspersa . . . . Rare.
79. Polia serena . . . . . Common.

80. Polia lichena. The first known British specimen was obtained in 1845. Mr. Maitland has taken thirteen specimens during the autumns of 1846, 7, and 8.
81. Acronycta megacephala . . . Rare.
82. ——— ligustri . . . . Ditto.
83. ——— psi . . . . . Ditto.
84. ——— rumicis . . . . Common.
85. Bryophila glandifera . . . Rare.
86. ——— perla . . . . . Ditto.
87. Thyatira derasa . . . . . Common.
88. Scoliopteryx libatrix . . . Ditto.
89. Plastenis subtusa . . . . Rare.
90. ——— retusa . . . . . Ditto.
91. Cleoceris viminalis . . . . Ditto.
92. Cosmia affinis . . . . . Ditto.
93. ——— trapetzina . . . . Common.
94. Xanthia flavago . . . . . Rare.
95. ——— aurago . . . . . Ditto.
96. Orbona rufina . . . . . Ditto.
97. ——— ferruginea . . . . Ditto.
98. Gortyna micacea . . . . . Ditto.
99. Leucania comma . . . . . Ditto.
100. ——— pallens . . . . . Common.
101. Phlogophora meticulosa . . Ditto.
102. Cucullia scrophulariæ . . . Rare.
103. ——— verbasci . . . . . Common.
104. ——— umbractica . . . . Rare.
105. ——— chamomillæ. A rare species, common here in the larva state.

106. Cucullia absinthii. A very local species, but common here in the larva state.
107. Erebomia ochroleuca . . . Rare.
108. Abrostola urticæ . . . . Ditto.
109. Plusia percontationis . . . Ditto.
110. ——— gamma . . . . . Common.
111. ——— chrysitis . . . . . Rare.
112. Heliothis peltigera . . . . Very rare.
113. ——— armigera . . . . Ditto, ditto.
114. Acontia luctuosa . . . . . Common.
115. Phytometra ænea . . . . . Ditto.
116. Mormo maura . . . . . Ditto.
117. Catocala nupta . . . . . Ditto.

GEOMETRINA.

I. Geometridæ.

1. Anisopteryx æscularia . . . Rare.
2. Hybernia capreolaria . . . Common.
3. ——— defoliaria . . . . Ditto.
4. Phigalia pilosaria . . . . . Rare.
5. Biston betularius . . . . . Ditto.
6. Crocallis elinguaria . . . . Common.
7. Odontopera bidentata . . . Rare.
8. Geometra tiliaria . . . . . Ditto.
9. ——— erosaria . . . . Ditto.
10. ——— angularia . . . . Ditto.
11. ——— illunaria . . . . Common.
12. Rumia cratægata . . . . . Ditto.
13. Ourapteryx sambucaria . . . Ditto.
14. Campœa margaritata . . . Ditto.

15. Hemithea vernaria . . . . Common.
16. Cleora bajularia . . . . . Rare.
17. ——— lichenaria . . . . . Common.
18. Alcis repandaria . . . . . Ditto.
19. Hemerophila abruptaria . . . Ditto.
20. Tephrosia abietaria . . . . Rare.
21. ——— crepuscularia . . . Common.
22. Halia Vauaria . . . . . Rare.
23. Cabera pusaria . . . . . Common.
24. ——— exanthemata . . . . Ditto.
25. Ephyra omicronaria . . . . Rare.
26. ——— trilinearia . . . . . Ditto.
27. Bradyepetes amataria . . . . Ditto.
28. Epione apiciaria . . . . . Ditto.
29. Phasiane plumbaria . . . . Ditto.
30. Larentia cervinaria . . . . Ditto.
31. ——— chenopodiata . . . Common.
32. ——— bipunctaria . . . . Ditto.
33. ——— multistrigaria . . . Ditto.
34. Cidaria didymata . . . . . Rare.
35. ——— unidentaria . . . . Common.
36. ——— ferrugaria . . . . . Ditto.
37. ——— miaria . . . . . Ditto.
38. ——— olivaria . . . . . Ditto.
39. ——— montanata . . . . . Ditto.
40. ——— fluctuata . . . . . Ditto.
41. ——— propugnata . . . . Ditto.
42. Harpalyce fulvata . . . . . Rare.
43. ——— occellata . . . . Common.
44. ——— galiata . . . . . Ditto.

45. Harpalyce subtristata . . . . Common.
46. ——— sylvaticata . . . . Ditto.
47. ——— corylata . . . . Rare.
48. Polyphasia immanata . . . . Common.
49. ——— centum-notata . . Ditto.
50. Lampropteryx suffumata . . . Ditto.
51. ——— badiata . . . Ditto.
52. Anticlea rubidata . . . . . Ditto.
53. ——— derivata . . . . . Ditto.
54. Electra spinachiata . . . . Rare.
55. ——— testata . . . . . Common.
56. ——— pyraliata . . . . . Ditto.
57. Aniatis plagiata . . . . . Ditto.
58. Abraxas grossulariata . . . . Ditto.
59. Zerene procellata . . . . . Ditto.
60. ——— adustata . . . . . Ditto.
61. ——— rubiginata . . . . . Rare.
62. Euthalia miata . . . . . Ditto.
63. ——— psittacata . . . . Ditto.
64. ——— impluviata . . . . Ditto.
65. ——— elutata . . . . . Common.
66. Phibalapteryx tersata . . . . Rare.
67. ——— vitalbata . . . Common.
68. Lozogramma petraria . . . . Ditto.
69. Triphosa dubitata . . . . . Ditto.
70. ——— cervinata . . . . . Rare.
71. Camptogramma bilineata . . . Common.
72. Charissa pullaria . . . . . Ditto.
73. Oporabia dilutata . . . . . Ditto.
74. Cheimatobia brumata . . . . Ditto.

75. Cheimatobia rupicapraria . . Common.
76. Lobophora viretata . . . . Ditto.
77. Eupithecia subærata . . . . Rare.
78. ——— rufifasciata . . . Common.
79. ——— nebulata . . . . Ditto.
80. ——— subfulvata . . . Ditto.
81. ——— centaureata . . . Ditto.
82. ——— venosata . . . . Ditto.
83. Bapta punctata . . . . . Ditto.
84. Emmelesia decolorata . . . . Rare.
85. ——— albulata . . . . Ditto.
86. Strenia clathrata . . . . . Ditto.
87. Venilia macularia . . . . . Common.
88. Ptychopoda fimbriolata . . . Ditto.
89. ——— lividata . . . . Ditto.
90. ——— incanata . . . . Ditto.
91. Acidalia osseata . . . . . Ditto.
92. ——— subsericeata . . . . Ditto.
93. ——— aversata . . . . . Ditto.
94. ——— inornata . . . . . Ditto.
95. Pæcilophasia marginata . . . Ditto.
96. Chlorissa thymiaria . . . . Ditto.
97. ——— putataria . . . . Ditto.
98. Timandra imitaria . . . . . Rare.
99. Ania emarginata . . . . . Ditto.

II. Platypterycidæ.

1. Drepana falcataria . . . . . Common.
2. Cilix compressa . . . . . Ditto.

III. Pyralidæ.

1. Hypena proboscidalis . . . . . Common.

2. Hypena rostralis . . . . . Rare.
3. Pechypogon barbalis . . . . Common.
4. Paracolax derivalis . . . . Ditto.
5. ——— nemoralis . . . . Ditto.
6. Synaphe angustalis . . . . Ditto.
7. Aglossa pinguinalis . . . . Ditto.
8. Pyralis farinalis . . . . . Rare.
9. Simaethis fabriciana . . . . Common.
10. Pyrausta purpuralis . . . . Ditto.
11. ——— punicealis . . . . Ditto.
12. ——— porphyralis . . . . Ditto.
13. ——— cespitalis . . . . . Rare.
14. Phlyctænia sambucata . . . Ditto.
15. Eurrhypara urticata . . . . Ditto.
16. Mesographe forficalis . . . . Common.
17. Margaritia asinalis . . . . . Ditto.
18. ——— verticalis . . . . Ditto.
19. ——— cinctalis . . . . Ditto.
20. ——— hyalinalis . . . . Rare.
21. ——— ochrealis . . . . Ditto.
22. ——— longipedalis . . . Common.
23. ——— flavalis . . . . . Ditto.
24. ——— ferrugalis . . . . Ditto.
25. ——— sticticalis . . . . Rare.
26. ——— prunalis . . . . Common.
27. ——— olivalis . . . . . Ditto.
28. Nola strigulalis . . . . . Rare.

My list does not include the Tortricina, and therefore with this closes the notice of the Butterflies and

Moths already found in the Undercliff; and it will be seen that the district produces some very rare and interesting species. I have no doubt the catalogue might be much enlarged by further investigation; but, I regret to add, Mr. Maitland, a most industrious collector, has lately left the place, and I fear we must be content, for a time at least, to confine our list to that now given.

I should mention that a great number of the night-flying moths have been taken by the plan lately adopted, of using a preparation of sugar on the trees and bushes to attract them.

CHAPTER VI.

GEOLOGY AND HYDROLOGY.

In examining the natural productions of a country or district, one of the first objects that strikes the attention is that of the geological structure of its surface. What a field this opens for inquiry! What can exceed the interest naturally excited in the mind when it reverts back to ages which have no place in this world's history? Thought itself becomes bewildered by the speculation which oppresses it. The spot on which the inquirer stands may possibly have been the seat of that vast movement when earth was formed from chaos, and each primitive mass burned with volcanic fire, evolving in the cooling of its incandescent body those precious metals and gems which were destined hereafter to become the delight or curse of man.

Or, it may be, he now surveys the vast bed of a former ocean, whose depths contained the first germs of organic life. His foot may now be placed on the precincts of some primeval lake, whose immense expanse reduces to insignificance those now existing in the western world, and whose deposits court the search of the scientific investigator. Or some huge river may

have finished its devious course in the expanded delta, whose dry beds the philosopher now beholds, and whose inhabitants existed ere man was yet created.

Few spots in Britain of similar dimensions contain more objects of geological interest than the Isle of Wight. It presents the characters of the tertiary formations (the Eocenic period of Lyell), consisting of depositions partly derived from rivers and partly from the sea, and containing detritus of various kinds, such as shells and plants, the bones of fish and turtles, of saurians, or animals of the lizard tribe, and also of some extinct mammalia. Teeth of the crocodile and shark are also found in this division, as well as wood and the fruit of some former species of the Cycadeæ or Pine tribe.

Immediately below the Tertiary Eocene lies the Cretaceous group, which consists of the marine deposits of former oceans, many of them highly fossiliferous. This series is made up of the two beds of Chalk, Upper and Lower, superimposed on Chalk Marl; then follows the Upper Greensand, with its various strata of Chert, Firestone, Limestone, Freestone, &c.; and to this succeeds the argillaceous bed of Gault, which again rests upon the Lower Greensand, or Ferruginous sand, as it was formerly called; below which we find the Wealden or Hastings sand, which crops out at various parts of the Island, as at Sandown Bay, and along portions of the south-western coast from Atherfield Bay westward, forming as it were

a transition-series between the last-named and the Oolitic formation.

Such is a very brief outline of the interesting geological structure of the Island in general; our description, however, will be confined to the Cretaceous group, of which alone the Undercliff is formed, and whose rude masses, chaotically rolled together during the vast convulsion which must have originally created this singular district, give that peculiar character to the scene which distinguishes it from almost every other spot in Britain.

The Undercliff presents, in consequence of the manner in which it was modelled, a series of irregular terraces, made by the *débris* of the displaced stratification, and backed by the mural escarpment which forms its northern boundary. It can hardly be expected that any regular geological disposition should be observed in these fallen masses; yet so extensive are some of them, that their mineral structure and organic remains may be investigated in some places with great facility.

That this singular district has been originally formed by the combined action of wind, rain, and frosts, added to the powerful influence of the land springs, and the action of the waves of the ocean, can hardly, I imagine, be doubted; and that such has been the case, the two examples, which have occurred at either extremity within the memory of man, not only afford an apt illustration of the probable truth of the remark, but also distinctly point to the disturbing forces by

whose powerful agency the changes have been effected.

The "great Landslip," as it was called, took place between Niton and Black Gang in 1799; and the others, which form the beautiful romantic scenery at East End, occurred in 1810 and 1818.

When Sir Henry Englefield visited East End about the year 1800, he remarked, "Although deep cracks and evidences of continual subsidence intersect every part, yet the rocky cliff more to the northward seems to have attained perfect stability, and the luxuriant coppices must long have grown undisturbed." When Mr. Webster traversed the spot ten or eleven years afterwards, a considerable fall had taken place, and he could hardly recognise the features of the scene as described by Sir Henry. Mr. Webster then gave it as his opinion that a further slip would occur; and his remarks were verified in seven years afterwards. Some smaller slips have since taken place, in consequence of which the land was well drained, which has had the effect in a great measure of preventing their further occurrence. The cliffs exposed by these slips are already beginning to assume the timeworn aspect and weather-beaten appearance of the grand wall of the Undercliff.

That the period of the great subsidence is very remote, is proved by the fact that the sites of the various churches and chapels with which this tract is, or has been studded, have undergone no material change since their erection. The old church at Bonchurch is supposed to have been built about, or before,

the period of the Conquest; and although no disturbance has apparently taken place in the ground on which it stands, still it can scarcely be believed that the sea face of the cliff has remained unchanged since the time of its building. Its founders would hardly have placed it within two or three hundred yards of the brink of a mouldering precipice, which has sensibly fallen away within these ten years, and which at the moment I now write is in progress of still further disintegration. The advancing and receding character of the coast, which adds so much to its beauty, has, undoubtedly, been given to it by the action of the springs and tides on the softer strata lying in contact with them; and the mouldering down of rude masses of the harder portions from these causes, gives that rugged aspect to the shore which it presents at many points.

In few places is the disposition of the strata of a district so beautifully shown as in the Undercliff, and few localities offer so inviting a field of research.

The point from which the best view of the stratification of the Upper Greensand can be obtained, is the hill which crowns the headland known by the name of Hoody, or Woody Point. It is from this place the bird's-eye view given in the frontispiece was taken. The district being here seen from a very central situation, the eye at once takes in all the striking peculiarities of its geological features from east to west. The undulation of the chalky downs possesses all the characters of the lower bed of chalk; and the short fine turf with which they are covered forms, by the softened aspect

of its verdure, an apt back-ground to the scene below.

The line of stratification, when viewed from this spot, first becomes apparent just above Steephill Castle, that of Bonchurch being but dimly seen, owing to the distance, and the mass of trees and brushwood in which it is shrouded. It, however, soon becomes well developed after passing Steephill grounds, and just above Bank End farm (which lies on the left of the road to St. Lawrence, and in a line with the station-house to the sea), a *fault* occurs, and instead of the continuous horizontal contour of the strata which was hitherto preserved, it dips to the westward at an angle of nearly 45°. At this point a considerable portion of the superincumbent chalk appears to have fallen, or perhaps has been carried over by the force of water, and follows the dip of the cliff. The interruption only occurs, however, for the space of scarcely fifty yards, and the rocky barrier of the Undercliff again resumes its usual features, and appears, by the regularity with which its strata have been deposited, and by the loss of its softer parts from the action of weather, more like the fabric of human hands than the stupendous work of the Great Artificer of Nature.

The strata of blue limestone and chert which run through the Upper Greensand in this district, stand boldly out from the other less hard and durable deposits above them, while the softer bed on which they rest, having suffered still further from exposure, exhibits them more prominently in relief. At the pass, or steep

descent, called St. Lawrence or Whitwell "Shute," the continuous line of strata has been broken, I am inclined to think, by artificial means. It is not improbable that an aperture of some kind previously existed, and that the valley between the downs, from which the road descends into the Undercliff, indicated the place as being a favourable point for opening a communication with the villages in the interior of the island. It is certain, at all events, that great pains and much labour have been bestowed upon it within the last half century, to make the descent more easy and less dangerous.

From this point the extreme regularity of the various strata is most striking, and the different layers may be readily studied "in situ." At one spot above Old Park the chalky crown mounts to some height, and the more condensed masses which rest upon the marl rise in well-defined beds. Immediately below this elevation a depression is seen in the horizontal disposition of the strata, which, rising again at a short distance, and again slightly falling, gives it a curve which does not exist at other parts of the line. How can these inequalities be accounted for? Has a softer stratum been acted upon by some of the numerous land springs which exist everywhere throughout the tract? or has the effect been produced by the greater weight of the superincumbent mass pressing out some of the softer gault which lies beneath it, as it has done in some of the disintegrated portions in various parts of the Undercliff?

From this point the chalk gradually diminishes in thickness, and the covering is inconsiderable at the defile up which the road to Niton passes. Above West Cliff House the cliff again resumes its former character, and continues with more or less variety until it subsides into the basin of the Lower Greensand below the western face of St. Catherine's Down.

A general idea having been formed of the relation of each particular stratum to the other, in surveying the line of cliffs just now described, a more intimate knowledge of their particular formation, and the fossils which they contain, may be readily obtained by the examination of the isolated masses which everywhere appear, but which for geological purposes are better seen on the sea shore. The action of the sea has here added to the effects of the atmosphere in destroying the softer parts of the mass; and the fossiliferous portions, from their harder and more enduring character, are well shown.

But these changes seem not to be confined to the outline and general configuration of the sea coast, for it is said that the high lands to the northward of the wall of the Undercliff have also altered in height. At the time Sir Richard Worsley published his history of the Island (1781), it was affirmed by persons then living, that, at an antecedent period, Shanklin Down, or Dunnose, could not be seen from St. Catherine's, except from the top of a beacon which then stood near the chapel. Had such a subsidence taken place, it would probably have been accompanied, as Sir Henry Engle-

field remarks, by the occurrence of fissures in the soil in the neighbourhood: if such did occur, no attention seems to have been drawn to them; and though we will not entirely reject a report which appears to have attracted notice at the time, it must be received with caution. St. Catherine's, itself, is said to have decreased in altitude since the period of former surveys; and thus much is certain, that some peculiarities are found in making scientific experiments on some of the heights in the neighbourhood.

The chalk which caps the Upper Greensand of the Undercliff, and which forms the rounded surface of the Downs, being composed of the *lower bed* of this particular deposit, contains no flints; but various nodules of fossilized organic matter, together with other remains to be alluded to hereafter, are frequently found in it. Some parts of this lower bed are of sufficient hardness to be used in forming the internal walls of buildings, and these are well seen in the cutting which forms the approach to the descent into Ventnor, from Sloven's Bush, on the Appuldurcombe road. The only portion of the lower bed of chalk which may be said to be actually in position in the Undercliff, without of course including the *débris* which exists everywhere, is a headland called Whitestone Point. It is situated near Horse Shoe Bay, Bonchurch, and is remarkable as being the whitest part of the island seen between Culver Point and Freshwater Bay.

Although the lower bed of chalk contains no flints, the vast quantity of the latter deposited in what are

called "pits," or hollows, in the Downs, gives abundant evidence that there originally existed a superior stratum, the detritus of which they undoubtedly are. Many very interesting fossils are found among these flints, such as Echini, belemnites, casts of various shells, &c. Below this bed of chalk lies the chalk marl, which is of uncertain thickness; and it is to the precipitated masses of this stratum, together with the higher band of the Upper Greensand immediately below it, containing as they do large quantities of phosphoric organic remains, and to the use of which for agricultural purposes much attention has lately been directed, that the Undercliff no doubt owes much of its fertile character.

The fossils of the chalk marl are numerous, and the following are some of the more prominent genera and species.

Various corals and zoophytes.
Echini, several species.
Spatangi, various species.
Inocerami, ditto.
Inoceramus plicatus.
Pecten, several species.
Gryphææ.
Arca.
Terebratulæ.
Pterocera.
Cerethium turriculatum.
Turbo.
Ammonites varians.
„ Rhotomagensis.
„ falcatus.
Nautili, several species.
Nautilus elegans.
Scaphites.
„ æqualis.
Turrilites.
„ costatus.
„ undulatus.
Baculites.

Bones of a Saurian.
Palatal bones.
Shark's teeth.
Coprolites.

The Upper Greensand formation commences below this bed of marl, and is shown in the Undercliff in greater thickness, and of a more characteristic appearance, than usually belongs to it on the southern shores of England. All the different strata of which it is composed have been comprised by Dr. Mantell under the denomination of "Firestone." This term, which is applied to a particular kind of sandstone of this series, found in Surrey, on account of its being employed in forming linings for fire-places and furnaces, seems to be used in this district with doubtful propriety; two very inconsiderable layers alone of this substance existing in the strata of the cliff. They do not in general here exceed eight inches each in thickness, and lie about thirty feet below the chalk marl.

Beds of different strata containing modifications of sandstone, with silicious and calciferous matter, compose the Upper Greensand; and the green grains of the silicate of iron dispersed among them, far more sparingly than in the Lower Greensand, give that peculiarity to the formation from which it derives its name.

I have endeavoured to obtain a correct measurement of the Upper Greensand Group, as it occurs in the Undercliff, and through the kindness of my friend Mr. Saxby, who has very carefully taken the levels of the strata in the neighbourhood at the most favourable points, I am enabled to give a description of the altitude of this formation, approaching, I have every reason to believe, to great accuracy.

I have thought it desirable to separate the various

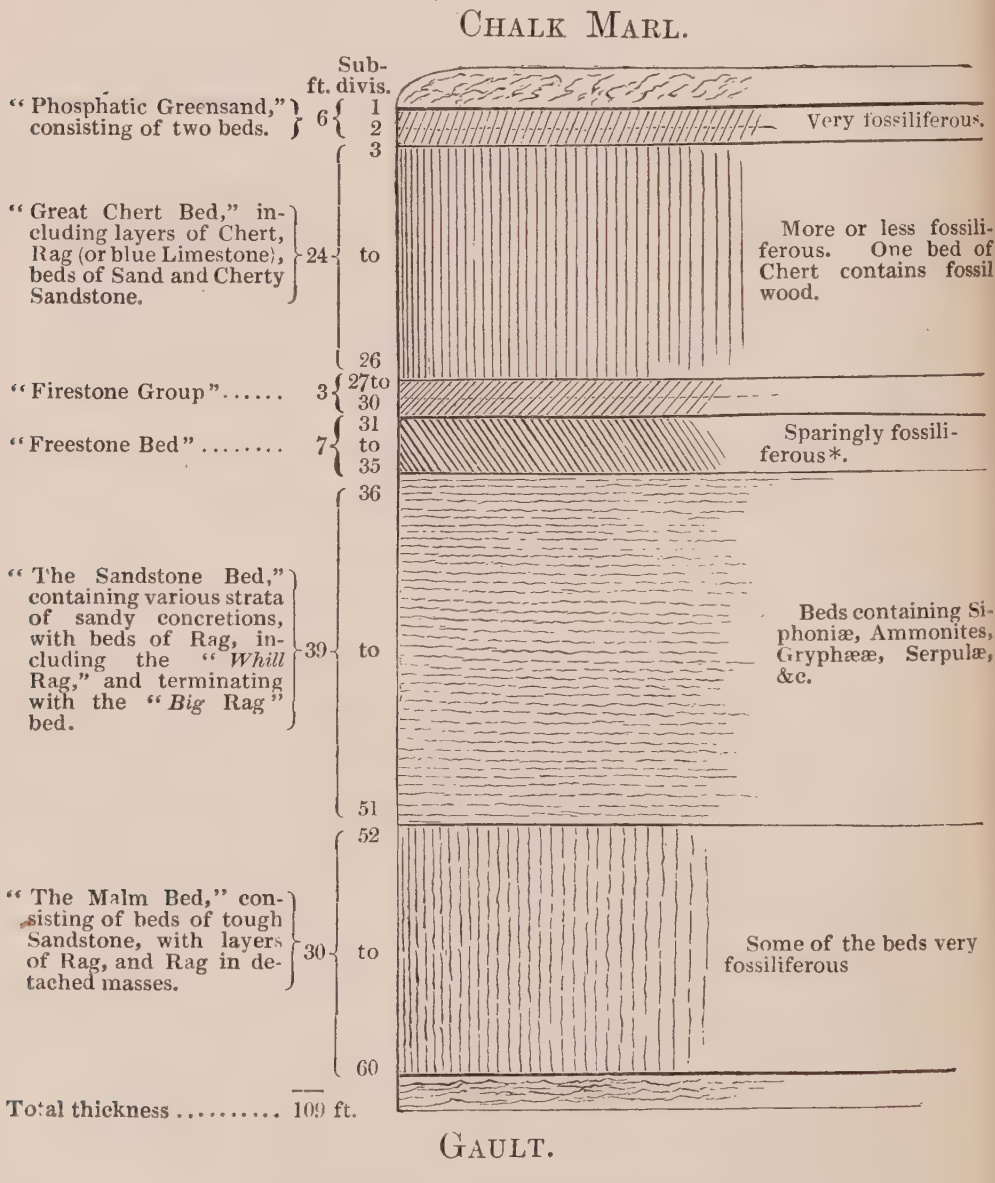
strata into different groups or divisions, and again to subdivide them into the beds of which they are composed, as by so doing I should attain a certain uniformity in description with that of the Lower Greensand given by Dr. Fitton in his excellent paper published in the Quarterly Journal of the Geological Society for August, 1847, and from which I have principally taken the account of that formation contained in a subsequent part of this chapter.

It must not be imagined that every stratum or layer here described can be *accurately* defined on the spot; yet the more prominent will be readily recognised, and the various depths at which they occur will sufficiently point out their relative positions.

I have much to regret that I cannot assign to the fossils found in the upper greensand their particular places in each of the different beds where they occur, and also that I cannot give the specific names to many of the genera which are met with; but my time has had so many more important claims upon it, that I have been compelled to abandon the design I once entertained of giving similar lists to those so admirably drawn up by Dr. Fitton. Should I be called upon, however, at any future period, to revise this description, I hope to be able to present a more perfect account of the fossiliferous treasures of these particular beds.

Taking the lower surface of the chalk marl as our commencement, to the bottom of the bed of soft sandstone, beneath which a band of gault or blue clay is

first found, the extreme thickness of the Upper Greensand may be calculated at 109 feet. The annexed diagram will show the manner in which I have endeavoured to divide it.



* Some excellent fossils are occasionally found.

The First Division of this section may be subdivided into two parts; the first consisting of a bed of *dark* greensand, and the other exhibiting a *lighter* colour. They are both very fossiliferous, and measure each about 3 feet in thickness. In consequence of the phosphatic deposits recently ascertained to exist in these two beds, and to which I have already slightly alluded, I have been induced to distinguish this division by the name of the "Phosphatic Greensand" bed. It has been described in other counties as lying below the chalk marl to a depth of from 3 to 7 or 8 feet; in this district, however, its thickness is about 6 feet, by actual measurement, at various points.

We cannot call the attention of the agriculturists of the neighbourhood too strongly to the fact of so rich and valuable a manure lying thus near their reach. It would appear the fertilizing properties of this greensand have long been known; though it has not been until very recently, in consequence of the researches of Dr. Henslow in this country, and the investigations of Dr. Daubeny in a somewhat similar formation in the province of Estramadura in Spain, that the true nature of its valuable qualities has been ascertained. The fertilizing property in its composition appears to belong to the phosphatic nature of the fossils with which it abounds. These include various amorphous masses of organic remains, sponges, Ammonites, &c., containing more or less phosphate and carbonate of lime, with some oxides of iron, and alumina, and in-

soluble silicious matter. These beds possess a more calcareous character in this district than they obtain in some other places, which gives them a browner colour, and increases their power of fertility. It is not, however, to the higher band of the Upper Greensand that this valuable property exclusively belongs: nearly all the other strata of this group include fossil remains which are equally rich; but, as a general rule, the fossiliferous matter is more widely distributed, and presented under different circumstances from that which occurs in the beds we have been describing.

Before passing from the subject of the applicability of this formation to agricultural purposes, I may mention that the fossils, also, of the gault possess the same character, but they are more sparingly met with, though they are generally extremely rich in phosphoric acid.

The Lower Greensand has not yet been sufficiently investigated, with a view of ascertaining the amount of its phosphoric remains; but it seems that the bed which lies *immediately* below the gault has been found to contain these deposits, wherever the junction has been examined in the Isle of Wight, from Culver Cliffs to Atherfield Point.

Large quantities of these fossil remains, fit for agricultural purposes, are found on the beach at various parts of the Undercliff, as well as some black fossil wood, which is also very rich in phosphoric acid. The power of fertility which the *débris* of the various beds

of Upper Greensand possess, may be evidenced by the luxuriance of the crops where the refuse of the quarries in the Undercliff have been spread over the land.

The Second Division, in this group, consists of beds of Chert, (a silicious sandstone,) which forms a very good material when properly broken for making roads, and which obtains the name, in this neighbourhood, of "schotterwitt," or "shatterwitt." These chert beds alternate with layers of hard calcareous rock, or limestone, called in the district "rag;" strata of which are continued, at uncertain intervals, to within four feet of the gault. This stone is well adapted for building purposes, and, when submitted to the kiln, it produces a strong lime. Many fossils, especially pectens, are found in these layers, some of which will be more particularly described as we proceed. Besides these beds of chert and rag, strata of cherty sandstone and beds of greenish sand occur, below each of which is usually placed a thin layer, which is here called its "cock-bed." These consist of a hard and brittle cherty sand, breaking into square fragments, and unfit for building or other purposes. They also occur occasionally below a bed of chert, *but none are found lower than the bed of freestone.*

This division, which I have named the "Great Chert Bed," is about 24 feet in thickness, and includes 24 layers or strata, varying from 4 feet to a few inches in depth, of the various formations named above. The chert itself contains vast quantities of zo ophytic

remains, apparently spiculæ of sponge, zanthidiæ, &c., which may be seen when placed under a good microscope, as also minute fragments of an apple-green colour, possibly chlorite.

I regret I am unable to give a list of the characteristic fossils found in the "Great Chert Bed;" but I believe there are very few, if any, which do not occur in the other divisions of the Upper Greensand.

The Third Division comprises those beds from which Dr. Mantell has proposed to name the whole of this series, namely, the "Firestone Group." These consist of an upper bed, about eight inches thick, superimposed on a layer of rag of nine inches, succeeded by the lower bed of firestone, also about eight inches in thickness, which rests upon a cock-bed measuring from two to three inches.

This firestone, when first quarried, is of a soft character, but hardens upon exposure to heat. The lower bed has been found to answer best for the purposes to which it is usually applied. The "Firestone Group" occurs about thirty feet below the chalk marl.

The Fourth Division is an important one, as, independent of the great utility of the material it furnishes for building purposes, its deposition would appear to form a well marked epoch in the history of the Upper Greensand. I have subdivided this group into five sections. The first consists of a bed of sandstone, about a foot in thickness, denominated the "top-bed;" to this succeeds a layer of rag of about eight inches.

The third section includes another bed of sandstone, of about the same depth as the rag, which is used for cleaning hearthstones. The fourth section comprises the bed of freestone, about four feet thick, from which the group derives its name. The freestone rests upon a bed of rag, about a foot in thickness, which completes the last subdivision of this series. The freestone stratum lies about 34 feet from the top of the Upper Greensand; Webster gives it as about 30 feet, at which depth the upper layer of *firestone* first occurs. A popular error exists among some of our native masons, of the identity of the freestone found in the Upper Greensand with that which occurs in the oolitic formation, and known under the name of "Portland Stone," and to which the term is most generally applied. I have before said that no cherty or silicious strata are found below the bed of freestone; there is, however, a cherty kind of cock-bed lying below the layer of rag immediately under it, and this would appear the last instance of the occurrence of chert in the Upper Greensand.

The Fifth Division, which extends to a depth of about 39 feet, I have denominated the "Sandstone Bed," to distinguish it more particularly from the division below it, which, although composed principally of sandy strata, yet presents a somewhat different mineral character. I have subdivided this group into fifteen sections; the first is composed of a bed of yellow sandstone, about three feet in thickness, abound-

ing in fossil remains of siphoniæ, with very large ammonites, nodules of rag, &c.

To this succeeds a layer of rag, about a foot in thickness, below which another bed of yellow sandstone occurs, which is of a softer nature than the one above it, and extends to a depth of about three feet.

Lying in contact, immediately below the last named bed, is a layer of tough sandstone, about one foot thick, called by the quarrymen "Malm," or "Black Bed."

To this succeed seven alternating strata of light sand, and belts of this malm, and also one containing nodules, amounting altogether to about seven or eight feet in thickness.

Below these beds a very interesting band of rag occurs, called the "Whill Rag;" it is about one foot thick, and contains large nodules, somewhat similar in shape to a compressed cone. These are frequently found of large size, and are here called "Whills;" they are softish on the outside, but become very hard towards the centre, and include fossil remains of Ammonites*, &c.: a close examination of these nodules would, I doubt not, amply repay the trouble of the geologist.

The next subdivision in this group consists of a bed

* Mr. Saxby possesses a magnificent specimen of a crustacean, about one foot in length, derived from one of these "whills," and a very interesting Ammonite, with the beak entire, has also been obtained from a similar source.

of sandstone about ten feet in thickness, fossiliferous at the lower part, and containing nodules of rag. Succeeding this bed is a layer of rag about a foot thick, which separates it from a somewhat similar bed of sandstone, also about ten feet in depth, containing gryphææ, serpulæ, &c. Below this stratum lies what is termed the "Big Rag," about eighteen inches thick, which includes nodules and various fossils. This bed terminates the sandstone group.

The Sixth and last Division extends from the "Big Rag" down to the Gault, being about thirty feet. It consists of five different beds of the particular formation I have before mentioned as being here called "Malm." These are divided at intervals by bands of rag measuring, generally, about a foot in thickness. The "malm" is a tough sandstone, more or less fossiliferous, and must not be confounded with the hard silicious rock which bears the same name in some parts of Sussex.

Immediately below the last bed of "malm" the first layer of gault occurs; below it is what is called the "white" or "rubble gault;" it contains fish scales, and other organic remains. The following is a list of some of the more prominent fossils found in the upper greensand bed, kindly furnished me by Mr. Saxby, and principally contained in his collection:—

* Clathraria Lyellii.
Fragments of fossil wood.
Siphoniæ, various species.
Corals, ditto.
Echini.
Spatangi.
Cidaris.
Fibularia.
Gryphææ, many species.
Ostrea carinata.
Anomia ——— (?)
Lima.
Exogyra.
Pecten orbicularis.
„ quinquecostatus.
„ Millerii (?)
„ asper.
As also many other species.
Avicula ——— (?)
Gervillia anceps.
Inoceramus plicatus.
„ several other species.
Trigonia alæformis.
„ spinosa.
„ carinata.
Panopæa mandibula.
„ plicata.
Three other species of Panopæa or Mya.
Cardium.
Arca Raulini.
Six other species of Arca.
Hemicardium Austini.
Venus or Thetis, two or three species.
Terebratula prælonga.
„ sella.
„ parvirostris (?)
„ many other species.
Cirrus, many species.
Euomphalus.
Actæon, or
Tornatella, six species.
Scalaria.
Natica.
Pleurotomaria.
Ammonites, various.
„ falcatus.
„ Goodhalli.
„ four or five other species.
Scaphites, two species.
Belemnites minimus (?)
„ „ (?)
Nautilus elegans.
„ „ (?)
Turrilites costatus.
„ Gravesianus (?)
Hamites elegans.
Baculites.
Astacus Vectensis (?)
Teeth of Squalidæ.
„ Saurians.
Besides the above, Mr. Saxby possesses, in his collection from the upper greensand, the claw of a crab; a species of Astacus, one foot in length; plate of a Turtle; some coprolitic remains, and very many other specimens.

* The Clathraria which is figured in Mantell's Geology of the Isle of Wight, was found in the grounds above Steephill Castle, and not at Bonchurch.

The vast masses of the Upper Greensand on the Undercliff are everywhere pierced by fissures, or, as they are popularly termed, "vents." These usually include a marly soil, containing in many instances relics by no means uninteresting.

I have in my possession the remains of several human skeletons which were found about ten feet below the surface when excavating a bank in my garden a few years since. The bank consisted of immense fragments of rock thrown confusedly together, and the bones were lying without any order (in one case the body being bent), apparently as if they had been overwhelmed. They comprised the remains of persons of different ages, from infancy to old age; the cranium of one, supposed to be a female of about 14 or 15 years of age, had the sharp point of a rock resting upon it, and a fracture on the opposite side of the skull. The lower jaw and teeth of an adult were in a very perfect state. I could discover no traces of utensils or instruments, or indeed relics of any description, but the fissure was of such a character that had these formerly existed they might readily have been lost.

Various other human bones have been found when quarrying in the district. The skeleton of a young female was found five or six years ago, about seven feet below the surface, and in such a position as to create a belief that she had been buried by a fall of earth. In this instance an armlet, apparently of bronze metal, weighing 472 grains, and pronounced by the Archæological Society to belong to the "Ro-

mano-British" period, probably A.D. 300, was picked up with the remains. The tongue of a fibula, or ancient buckle, was also met with embedded in vegetable earth. I am only aware of one instance of an ancient coin having been found within the precincts of the Undercliff; this was discovered in a quarry at Steephill, and proved to be of the time of one of the Cæsars. The Venerable Archdeacon Hill has in his possession a very rare Saxon coin found between Bonchurch and Shanklin. Bones of various animals are not unfrequently met with in quarrying, and I possess various bones of an animal apparently of the hog tribe, as also a portion of a magnificent antler which I have no doubt, from its size, once graced the front of a huge red deer, as a perfect skull of that animal has been found in a quarry at Bonchurch. While noticing the bones of the mammalia thus discovered in the Undercliff, I may allude briefly to a large quantity of the bones of mice and small animals found in a crevice among the fragments of a fall of the cliff a short distance beyond St. Lawrence. Speculation was at one time rife as to their origin, but I believe the most probable solution is, that they formed the remains of the prey collected in or near the domicile of a kestrel or small hawk; yet one is almost inclined to doubt so large a quantity could have been brought together by such means. Besides the relics of man and animals just alluded to, other remains occur in some of these "vents," which it is very difficult to account for. In a chink in a large rock near my house, which was opened

whilst forming a garden, a bed of cockle shells 18 inches in thickness was found, embedded in a sort of clayey marl. Whence could these have been derived? Certainly not deposited there by human hands; the rocks in which they were discovered were placed below a portion of the soil which had not been previously disturbed, and had, in all probability, occupied the same position since the Undercliff was formed. I am not aware of the cockle being found on our coast, although tolerably abundant on the northern shores of the Island.

There are also other evidences of the altered surface of the land. While digging a well in the garden of Aratrum Cottage, opposite the St. Boniface Hotel, the workmen arrived, at the depth of about ten feet, at a bed of vegetable matter, evidently the remains of a wood or thicket. Hazel nuts, and the thorns of brambles, were found in abundance, as also various leaves and branches of trees, &c., the whole mass resting as it were on a bed of peat.

The human remains I have mentioned must not be confounded with those which are occasionally found along the whole line of coast where the ground may be disturbed. These are usually the remains of shipwrecked mariners, who have from time to time been cast on the beach after the frequent wrecks which formerly occurred, and who have been thus buried by the fishermen by whom they were discovered.

The Gault, a more or less hard argillaceous sub-

stance, follows next in order to the Upper Greensand, and is known in the neighbourhood under the names of "blue slipper," "black slipper," "platner," or "platnore;" the two latter names allude more particularly to the lower and harder portion of this bed, while the former refer to the softer and more unctuous part. The Gault, generally speaking, differs somewhat in the Undercliff from the state in which it is found elsewhere. It is neither of so great a thickness nor so perfectly a clay, being less clammy, more arenaceous, and containing, generally, fewer fossils than in other situations where it occurs.

In an account of the disbursements consequent on repairs made upon the castles and forts of the island, during the reign of Queen Elizabeth, the following charges occur :—

" Carisbrook Castle,

" Wynnynge and carriadge of *hard plattner stone*, 126 tonnes, at 8*d*. the tonne . . . . £4 4 0."

To what stone can this refer? Certainly not to that generally used in building in that part of the island, as the charge below follows immediately in the same account :—

" Winninge and stapilinge of 11½ lode of *Freestone* at 2*s*. the lode . . . . . £1 3 0."

The Gault found in the Undercliff is usually in masses, apparently *pressed* out by the superincumbent weight when the whole was disturbed.

The bed itself frequently separates, and the beautiful manner in which this is shown, is occasionally exemplified on a small scale, when portions of this deposit in the debris of the ruined mass, slip over each other in seasons of wet or frost. I have observed the two different surfaces which have thus slid, present the appearance, long after it has taken place, of having been highly polished, and the separation has been as perfect as if made with a cutting instrument. Dr. Mantell remarks that fewer fossils are found in this formation in the neighbourhood of Bonchurch and Ventnor than in other situations in which it occurs; but some specimens of a highly interesting character, including coprolites, have been discovered there. It may be noticed here that the fossils of the gault are generally very tender, and are readily broken and fall to pieces on exposure to the air. In digging a well at Bonchurch, a few years since, a bed of gault was met with containing some very fine Ammonites and other shells.

Many of the nodules of sulphuret of iron, which under the names of "pyrites," "copperas," "thunderbolts," &c., are found on the shore in the Undercliff, are products of the gault. In the neighbourhood of Black Gang, where they are most abundant, persons are employed to collect them for the purpose of being sent to the vitriol works in the neighbourhood of London; in that locality, however, they are principally produced from the band of clay in the lower greensand.

The next and last constituent of the geological for-

mation of the Undercliff comprises those recently well-investigated strata known collectively under the denomination of the Lower Greensand. Dr. Mantell has applied the term of "*The* Greensand" to it, including the strata of the Upper Greensand formation, as I have before remarked, under the name of "*Fire Stone.*" I have, however, preferred adhering to the terms used by Fitton, Ansted, Ibbotson, Forbes, and others, and dividing the two series of the "Green sand," which are separated by the Gault, into the "Upper" and "Lower."

The Lower Greensand was included by Webster, together with the Wealden, under the common appellation of ferruginous sand; but the closer researches of Ibbotson, Forbes, and Fitton have clearly demonstrated the non-identity of the two, and have satisfactorily discovered the point at which they join. This formation is only partially seen, except at the two extremities of the Undercliff; but it is at Black Gang that it should be visited by those who seek to investigate its characters and to search for its fossil treasures.

The Undercliff, strictly speaking, terminates at Black Gang; but I feel that a more extended notice of a spot which has recently excited considerable attention in the geological world may not prove unacceptable. I purpose, therefore, to take for my guide a very valuable paper, by Dr. Fitton, given in the "Proceedings of the Geological Society," which was read before that body, by the author, in January, 1845. Between that period, however, and June, 1847, the Doctor further investigated these strata, in company with Mr. Morris, F.G.S.;

and, having the benefit of the results made by the examinations of the same locality by Captain Ibbotson and Professor Edward Forbes, as well as the Reports of the British Association, he was enabled to make additions to his original notice, and give a more perfect account of the various sections of the lower greensand. Dr. Fitton has also published a tabular chart descriptive of the different strata, and given a list of the various fossils found in them *. In his valuable tract, Dr. Fitton proceeds from west to east, and, commencing at the Wealden, describes each stratum as it occurs until he reaches the gault; as our course, however, has been from the opposite direction, we shall commence our notice from the gault, describing the lower greensand as it extends from Black Gang to its junction with the Wealden at Atherfield. He commences by making sixteen divisions of strata, which are again subdivided into fifty-five, and the fossils appropriate to each are indicated in their proper places.

The whole thickness of the Lower Greensand, from the bottom of the gault to its junction with the Wealden or Hastings Sand, is estimated at about 800 feet.

The Upper Division comprises seven layers of various sands and clays occupying a space of more than 130 feet of thickness, the greater portion of which is composed of scarcely concreted sand occasionally inter-

* The numbers of these have been again recently added to, by some most interesting specimens, obtained by my friend Mr. Saxby, one of which appears to be of an entirely new species.

mixed with dark argillaceous or carbonized matter. But few fossils have been found in this group.

The Second Division includes three strata: the first a mass of clay, mixed with sand, about 60 feet thick, and not fossiliferous; although about 30 feet from the bottom it contains many ferruginous nodules. The second is a bed of silicious sandstone: it contains no fossils, but is used in the manufacture of glass; it is about 18 feet thick. The third section in this division is about 40 feet thick, and contains pyrites with some lignite or fossilized wood; but other descriptions of fossils are very rare or altogether wanting.

The Third Division is occupied by one single stratum of about 20 feet in thickness, which Dr. Fitton has further subdivided into three sections, according to the different fossils which they contain. The upper one of these is composed of "ferruginous concretions over which the streamlet at Black Gang runs immediately above the cascade;" it occupies, together with the bed of subfossiliferous sand below it, a space of between 6 and 7 feet. Immediately succeeding this subdivision is one containing the following fossils:—

Fossil coniferous wood.
Panopæa plicata.
„ Neocomiensis.
Pholadomya Martini.
Cardium peregrinosum.
„ Voltzii.
Corbis corrugata.
Cyprina angulata.
„ rostrata.
Isocardia Neocomiensis.
Thetis minor.
Corbula striatula.
Mytilus lanceolatus.
Gervillia anceps.
„ solenoides.
Lingula truncata.
Avicula pectinata.
Anomia ——— ?
Terebratula multiformis (var. Gibbsiana).

Lucina solidula.
Mactra (Carteroni) ?
Arca Cornueliana ?
Nucula antiquata.
Trigonia alæformis.
„ caudata.
„ rudis ?
Pinna Robinaldina.
Cytherea caperata.
Venus parva.
Terebratula sulcata.
Natica Cornueliana.
„ Gaultina ?
Rostellaria Robinaldina.
Dentalium cylindricum ?
Holaster complanatus.
Lonchopteris Mantellii.

This bed is about one foot in thickness, and is most abundant in fossils near Walpen High Cliff.

An intermediate layer of sand of about 7 feet thick, and itself fossiliferous, interposes between the band just mentioned and the third and last subdivision of this group, which consists of a "consolidated ferruginous sand-rock" about 5 feet in thickness, containing the following fossils:—

Corbula striatula.
Cyprina angulata ?
Thetis minor.
Trigonia alæformis.
„ caudata.
Avicula pectinata ?
Gervillia anceps.
„ solenoides.
Lingula truncata.
Rostellaria Robinaldina.
Turritella Dupiniana ?
Holaster complanatus.

Fourth Division.—This series Dr. Fitton separates into four subdivisions; the first is formed of sand alternating with dark clays, and is about 12 feet in thickness; the following fossils are found in it:—

Panopæa plicata.
„ mandibula.
Corbula striatula.
Lingula truncata.

The three remaining subdivisions are composed of sand with brown iron ore; greenish and brownish

sand, with traces of fossils; and sand-rock of white sand, with thin layers of clay. They form together a bed of about 80 feet thick, and are seen about Walpen, and on the shore below Black Gang.

Fifth Division.—This consists of a single bed of foliated clay and sand, about 22 feet in thickness, and contains nodules of pyrites; but Dr. Fitton has been unable to discover any lignite in it, although it is said to occur.

This bed sustains the cliff between Walpen and Black Gang Chines. It is not fossiliferous.

Sixth Division.—This comprises a bed of sand about 14 feet thick, containing a thin layer of fossiliferous clay about 2 feet from the bottom, while near the top are concretions with Pinna and other species; the fossils are:—

Panopæa plicata.	Ammonites Martini.
Pinna Robinaldina.	Lonchopteris Mantellii.
Trigonia rudis (Dædalea ?).	

The second bed included in this division is formed of dark bluish clay and greensand, containing pyrites, and is about 13 or 14 feet thick; no fossils have been found in it.

Seventh Division.—Contains two subdivisions named by Dr. Fitton the Upper Gryphæa Group. The first is composed of greensand, and is about $3\frac{1}{2}$ feet thick, and is the highest point in this section which has afforded specimens of Gryphæa sinuata. It contains the following fossils:—

Thetis minor.
Rostellaria Robinaldina.
Brissus ——— ?
Lonchopteris Mantellii.
Inoceramus gryphæoides ?

The second bed is about 18 or 20 feet thick, of diversified layers of green indurated sand, containing various shells and carbonised impressions; with ranges of different strata including Gryphæa sinuata; and about 4 feet from the bottom is a yellowish and brown sand, with some clay, likewise fossiliferous. The following is a list of the species:—

Coniferous wood.
Mytilus æqualis.
Thetis minor.
Gervillia Forbesiana.
Pecten interstriatus.
Gryphæa sinuata (several remarkable varieties).
Terebratula sella.
Fucoides ?
Fragments of Lonchopteris Mantellii.

Eighth Division.—This is "a mass of uniform greenish and grey sand, about 40 feet thick," and extends at the base of the cliff to a distance of about 1300 feet; its upper part is best seen in Ladder Chine. It includes several fossiliferous ranges, the upper one about 14 feet from the top contains decomposed fossils. About 6 feet from the base of this stratum is a bed consisting chiefly of thread-like serpulæ, apparently twisted together, with broad Terebratula sella, Pectens, Gryphæa sinuata, and Gr. levigata. The base of this division contains nodules of dark olive green stone, with nuclei of fossils resembling those of the Third Division.

Ninth Division.—The group comprised in this

section is called the Upper Crioceras Ranges, and is composed of sand containing nodules inclosing Crioceras; it extends from the shore below Walpen High Cliff through the lower chasm of Ladder Chine, crossing about the centre of Whale Chine, and finally going out on the east of Atherfield High Cliff: the bed is about 46 feet in thickness, and is subdivided into nine layers, it contains the following fossils taken in order as they are found, proceeding from above, downwards:—

Ammonites Martini.
Cardium Cornuelianum (with other fossils).
Ostrea (two species).
Gryphæa sinuata.
Mytilus Lanceolatus (var. edentulus).
Pinna ——— ?
Crioceras Bowerbankii.
Nautilus radiatus.
Panopæa mandibula.

Tenth Division.—Dr. Fitton subdivides this into two parts, the upper consisting of a brown fossiliferous clay about 33 feet thick, and the lower of a dark greenish mud of sand and clay, occupying a space of about 24 feet. The bed extends from the shore below Walpen Chine to Brown's Down. The first stratum contains the following:—

Panopæa mandibula ?
„ plicata.
Tellina inæqualis ?
Venus Vectensis.
„ (*near* to Parva).
Scaphites gigas ?
Nucula ——— ?
Isocardia Neocomiensis (qu. ornata ?).
Corbula striatula.
Lima semisulcata ?
Gryphæa sinuata.
Pinna Robinaldina.

The fossils found in the lower are these:—

Panopæa elongata ?
„ mandibula ?
Gryphæa sinuata.
Venus (Vectensis).
Vegetable impressions not determinable.

Eleventh Division.—This comprises the Lower Crioceras Ranges of Dr. Fitton, and includes eight subdivisions composed of sand with Crioceras nodules, being altogether about 16 feet in thickness. It is situated on the shore below Whale Chine, and contains the undermentioned fossils, which are irregularly distributed throughout the different beds :—

Crioceras Bowerbankii.
Ammonites Martini.
Scaphites gigas.
Gryphæa sinuata.
Ostrea carinata.
Terebratula sella.
„ Gibbsiana ?
Ostrea prionota.
Pecten orbicularis ?
Gervillia anceps.
Thetis minor.
Corbula striatula.
Serpula plexus.
Arca consobrinas.
„ Cornueliana.
Anomia Radiata.
Arca Gabrielis (A. exaltata).
Panopæa plicata.

Twelfth Division.—This is subdivided into three beds, the upper being composed of a greenish sand, the next being formed of large nodules inclosing Scaphites, and the lower consisting of a brown fossiliferous sand. It extends from the shore below Whale Chine upwards, towards Sandbank Stile.

The first bed is about 28 feet in depth, and contains :—

Gryphæa sinuata.
Pinna Robinaldina.
Ostrea carinata.
Terebratula sella (broad).
„ Gibbsiana.

The Scaphites nodules, comprising the next bed, are

about 2 feet in thickness, and produce the following fossils:—

Gryphæa sinuata.
Scaphites gigas.
„ Hillsii.
Anomia radiata.
Nautilus radiatus.
Ammonites Deshayesii.
„ Mantellii.

The lower bed is about 20 feet thick, and includes the undermentioned fossils:—

Pecten orbicularis.
Gryphæa sinuata.
Terebratula Gibbsiana.
Terebratula multiformis ?
Lima semisulcata ?

Thirteenth Division.—This is the Lower Gryphæa Group of Dr. Fitton, and contains three subdivisions of the relative thickness of 10, 2, and 20 feet. The first bed is seen on the shore below Atherfield High Cliff, and is composed at the lower portion of brown and reddish sand, and sand-rock, with polished fragments of brown iron ore, a form not hitherto recognised in the Lower Greensand of England; the upper part consists of ranges of Gryphæa sinuata. This bed contains:—

Lonchopteris Mantellii.
Siphodictyon gracile (new genus).
Chisma (new genus).
Brissus.
Panopæa plicata.
Trigonia rudis.
Pinna Robinaldina ?
„ sulcifera ?
Ostrea Leymerii.
„ carinata ?
„ prionota.
Pecten orbicularis.
„ interstriatus.
„ striato-costatus ?
Hinnites Leymerii.
Anomia convexa.
Terebratula sella.

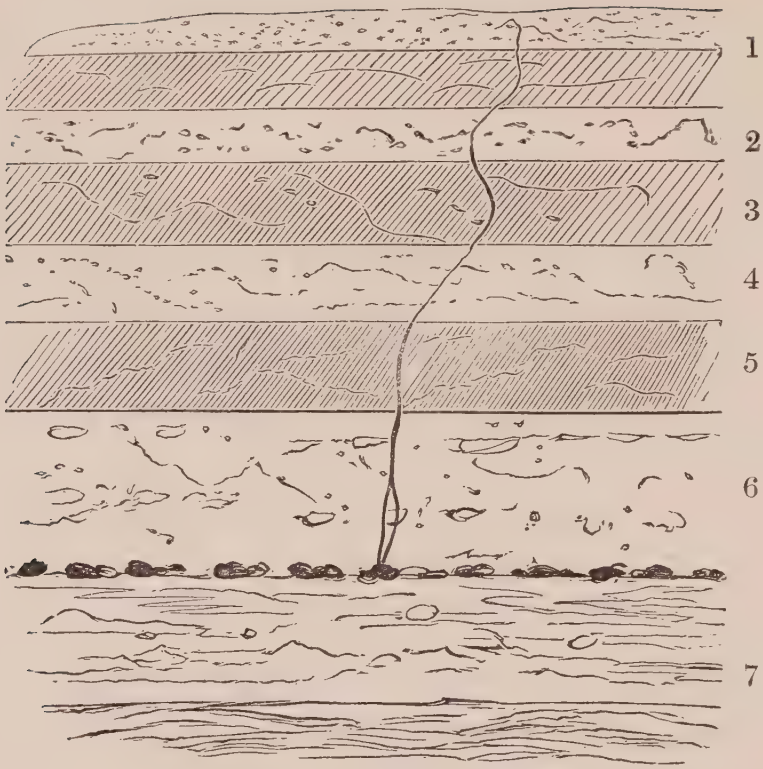
Inoceramus Neocomiensis. (*concentricus ?*)
Gryphæa sinuata (many varieties).
Serpula plexus.
„ antiquata.

The second subdivision, or "Terebratula bed," is of sand, containing Perna alæformis with Terebratula sella in profusion, and T. Gibbsiana (var.). The third bed consists of brown, or rust-coloured sand, with indications of fossiliferous nodules at the bottom; its fossils are—

Gervillia alæformis (Perna, *Sowerby*).
Lithodomus oblongus.
Gryphæa sinuata (var. couloni).

Fourteenth Division.—This constitutes that most interesting group known under the name of "The Crackers," from the sound produced by the waves of the sea in its lower cavities. Dr. Fitton has subdivided it into seven sections, and has given the following figure descriptive of them, which I have inserted here, in order that this most remarkable and highly fossiliferous portion of the lower greensand may be better understood by the reader.

It consists of four beds of clay alternating with others more sandy, including altogether a thickness of about 90 feet. Their position extends from below Atherfield High Cliff, ascending to the Atherfield station.



The first subdivision (1) consists of brown plastic clay containing the following fossils:—

Panopæa plicata.
Corbula striatula.
Cardium Cornuelianum.
Isocardia ornata.
Arca Raulini.
Nucula spathulata.
Venus Vectensis.
Gervillia linguloides.
Lima Cottaldina.
Rostellaria Robinaldina.
„ glabra.
Serpula (Vermetus) polygonalis.

The next stratum (2) is composed of a greyish sandy clay containing Astacoids, a species of crustacean allied to the lobster; it also yields the following:—

Panopæa plicata.
Pholadomya Martini.
Nucula spathulata.
Trigonia rudis.

Tellina ——— ? (*inæqualis ?*)
Gryphæa harpa.
„ sinuata.
Anomia radiata.
Avicula depressa ?
Rostellaria Robinaldina ?
Vermetus polygonalis.
Astarte numismalis.
„ transversa.
Arca exaltata ?
Nucula scapha.
Trigonia caudata.
Astacus Vectensis.
Mytilus æqualis.
Pinna Robinaldina.
Venus Vectensis.
Thetis minor.
Gervillia Forbesiana.
„ linguloides.
Lima (species).
Pecten orbicularis.
Ammonites Deshayesii.

The third subdivision (3) consists of a brown clay containing moulds of panopæa (mya) mandibula, as also these fossils:—

Panopæa plicata.
„ irregularis.
Corbula striatula.
Hemicardium Austeni.
Arca Raulini.
Nucula antiquata ?
„ scapha.
„ spathulata.
Venus Vectensis.
Cardium Raulinianum ?
Gervillia linguloides.
Lima ——— ?
Pholadomya Martini.
Pecten orbicularis.
Gryphæa harpa.
Ammonites Deshayesii.
Vermetus polygonalis.
Holaster complanatus.
Serpula polygonalis.

The next bed (4) is formed of a grey sandy clay, including the undermentioned fossils :—

Panopæa plicata.
Corbula striatula.
Isocardia ornata.
Cardium Cornuelianum.
„ subhillanum.
Actæon albensis ?
Rostellaria Robinaldina.
„ glabra.
Astarte numismalis.
Trigonia caudata.
„ rudis.
Arca Raulini.
„ cornueliana.
Nucula scapha.
„ spathulata.
Ammonites Deshayesii.

Thetis minor.
Gervillia linguloides.
„ Forbesiana.
Pecten quinquecostatus.
Astacus (portions of).
Avicula lanceolata.
Lima semisulcata.
„ (species).
Gryphæa semiplicata ?
Anomia radiata.
Tornatella marginata.

The fifth subdivision (5) consists of a bed of brown clay, about 17 feet in thickness, "including small nodules with astacoid remains, and other fossils in excellent preservation," of which the following are a list:

Astacoid remains (remarkably well preserved).
Modiola æqualis.
Rostellaria glabra.
Vermetus polygonalis.
Serpula (*Vermetus*).
Ammonites Deshayesii.

The next section (6) may probably be considered that from which the group derives its name. It is composed of coarse grey or brown sand, including two ranges of nodules, in consequence of which Dr. Fitton has further subdivided it into two portions.

The upper nodules which lie about a foot below the top of the sand, consist of coarse sandy limestone or grit, including fossil coniferous wood, as also these fossils :—

Panopæa plicata.
Arca exaltata.
Thetis minor.
Natica rotundata.
Trigonia caudata.
Cyprina angulata.
Cyprina angulata (var. *rostrata*).
Ostrea retusa.
Ammonites Deshayesii.
Holaster complanatus (*Spatangus retusus*).

Of the lower range of nodules some are six or seven feet long, and from a foot to 18 inches in thickness.

There are also other smaller masses, containing nuclei of small agglomerated shells, which have produced many new species not repeated in the other strata. Subjoined is a list of fossils found in the different masses of this lower range:—

Panopæa plicata.
Solecurtus Warburtoni.
Corbula striatula.
Tellina Carteroni (*angulata*).
„ Vectiana.
Cardium Ibbetsoni.
„ Cornuelianum.
„ subhillanum.
„ peregrinosum.
Arca Raulini.
„ securis.
„ Cornueliana.
Trigonia caudata.
Lucina Dupiniana.
Pinna Robinaldina.
Venus Orbigniana.
„ Vectensis.
Thetis minor.
Avicula ephemera.
Gervillia anceps (*aviculoides*).
„ linguloides.
„ alæformis (Perna).
Mytilus æqualis.
Pecten quinquecostatus.
Gryphæa harpa (*subplicata*).
Rostellaria glabra.
Pterocera Fittoni.
„ Retusa (*Rostellaria*).
Cerithium Lallierianum.
„ turriculatum.
„ (var. β.)
„ Neocomiense.
„ attenuatum.
„ Phillipsii.
„ Clementinum.
Dentalium cylindricum.
Actæon albensis (*Tornatella*).
Natica rotundata.
„ Cornueliana.
Rostellaria Robinaldina.
„ glabra.
Ammonites Deshayesii.
„ Hambrovii.

The sandy bed which contains these two ranges of nodules also includes the undermentioned fossils:—

Panopæa plicata.
Lucina Dupiniana.
Thetis minor.
Venus Vectensis.
Trigonia rudis.
Gervillia linguloides.
Mytilus æqualis.
Rostellaria glabra.
Pinna Robinaldina.
Serpula Richardi.
Astacus Vectensis ?
Teredolithes (Gastrochæna).

The last subdivision (7) is composed of brown sand and clay, and the fossils which occur in it are found in thin clusters, and often without crust. The following is a list of them:—

Pholadomya Martini.
Corbula striatula.
Nucula simplex.
„ spathulata.
„ scapha.
Mytilus æqualis.
Pinna Robinaldina.
Venus Vectensis.
Avicula lanceolata.
Gervillia linguloides.
Gryphæa harpa.
Pecten orbicularis ? ?
Lima ——— ?
Anomia lævigata.
„ convexa.
Ammonites Deshayesii.
„ Cornuelianus.
„ Hambrovii.
Astacus Vectensis.

The concretions in this bed also contain the following:—

Solecurtus Warburtoni.
Cardium Cornuelianum.
„ Ibbetsoni.
Nucula scapha.
Mytilus æqualis.
Lucina globiformis.
Venus Vectensis.
Pecten interstriatus.
Anomia radiata.
„ convexa.
Actæon albensis (*Tornatella*).
Natica rotundata.
Cerithium Neocomiense.
„ turriculatum.
Dentalium cylindricum.
Ammonites Deshayesii.
„ Cornuelianus.
„ Hambrovii.
„ furcatus.

Fifteenth Division.—Dr. Fitton has given to this great bed, which is about 60 feet in thickness, and composed of pale brown and grey clay, the name of "Atherfield clay," to distinguish it from the "Fuller's earth" of Surrey, to which it bears much resemblance. The remains of a turtle now in the cabinet of the

Geological Society were obtained here, and the following fossils are also found in this stratum :—

Panopæa plicata.
„ irregularis.
Cypricardia undulata.
Mactra Carteroni.
Corbula striatula.
„ incerta ?
Hemicardium Austeni.
Arca Raulini.
Nucula scapha.
Pinna Robinaldina.
Venus fenestrata.
„ Vectensis.
Avicula lanceolata.
Gervillia Forbesiana (*solenoides*).
Lima Cottaldina.
Gryphæa sinuata.
„ var. dorsata.
Ammonites Deshayesii.
„ furcatus.
„ inflatus.
Holaster complanatus.
„ Leopoldinus.
Serpula ——— ?
„ (vermetus) polygonalis.

The last and Sixteenth Division, is subdivided by Dr. Fitton into two beds called by him the Upper and Lower Perna beds, from the abundance of the particular fossil shell "Perna Mulleti" found in them. These beds are particularly interesting, as being immediately above the Wealden, and consequently being the last marine deposits in this series; they are also further remarkable for the number and interest of the fossils which they contain. The upper of these beds is about two and a half feet in thickness, and rises on the shore to the east of the point beneath the flagstaff of the coast guard station; its final outcrop being visible in the cliff top far westward, over the upper beds of the Wealden. The composition of the Upper Perna bed is a compact and durable dark blue sandy clay, or greensand; it runs out into the sea as a ledge, visible at low water, and is called the "Bench," and has been

traced to a distance of several miles from the shore. It contains the following fossils:—

Panopæa Neocomiensis.
„ mandibula.
„ elongata.
„ plicata.
Corbula incerta.
Hemicardium Austeni.
Cardium sphæroideum.
Trigonia caudata.
„ ornata (var. *spinosa*).
„ carinata.
„ Dædalea.
Arca Raulini.
„ securis.
„ exaltata.
„ Carteroni.
Astarte multistriata.
„ substriata.
„ numismalis?
Corbis corrugata.
Venus striato-costata.
„ Ricordiana.
„ Cornueliana.
„ ovalis (var. elongata).
Thetis minor.
Mytilus simplex.
„ lanceolatus.
„ bellus.
Perna Mulleti.
„ Ricordiana.
Serpula (Vermetus) concava.
Gervillia alæformis.
„ Forbesiana (*solenoides*).
Pinna Robinaldina.
Lima Cottaldina.
Pecten quinque costatus (var.)?
„ interstriatus.
Ostrea prionota?
„ carinata.
„ Leymerii.
Hinnites Leymerii.
Gryphæa sinuata.
„ harpa.
Terebratula sella.
Ammonites furcatus.
„ Deshayesii.
„ Leopoldinus.
„ inflatus.
Nautilus radiatus.
Heteropora ——— ?
Chisma furcillatum (new genus).
Cyathophora ——— ? (new species).
Holaster complanatus (*Spatangus retusus*).

The Lower Perna bed rises a few yards to the eastward of the signal staff of the coast guard station at Atherfield, and differs in composition from the Upper by being less compact, easily diffused in water, and

when exposed to the sea readily carried away. It is nearly three feet in thickness, and when dry is scarcely distinguishable from the bed above it. In the coarse quartzose gravel which occurs at the bottom and immediately over the Wealden, remains of the teeth and bones of fishes are found; they include the relics of the following genera:—

Lamna.
Odontapsis.
Saurocephalus.
Hypsodon.
Sphenonchus ? ?
Hybodus.

The fossils found in this bed consist of the following:—

Panopæa plicata.
„ Prevostii.
„ mandibula ?
Pholadomya Martini.
„ Agassizi.
Tellina ——— ?
Astarte obovata (*Beaumontii*).
Corbula striatula.
Hemicardium Austeni.
Trigonia caudata.
Arca exaltata (*Gabrielis*).
„ Raulini.
Lucina solidula.
„ globiformis.
Mytilus simplex.
„ æqualis.
„ bellus.
Venus parva.
„ fenestrata.
„ Ricordiana.
„ Cornueliana.
Thetis minor (*Sowerbii*).
„ major (*Sowerbii* var.).
Perna Mulleti.
Gervillia alæformis (*Perna*).
Lima undata.
„ semisulcata.
„ Cottaldina (*elongata*).
Plicatula placunæa.
Ostrea prionota.
„ carinata.
„ retusa.
Gryphæa sinuata.
„ lævigata (*sinuata* var.).
Hinnites Leymerii.
Pecten quinquecostatus.
„ interstriatus.
Terebratula sella.
„ Gibbsiana.
„ oblonga.
Rostellaria Robinaldina.

Emarginula Neocomiensis.	Serpula ——— ?
Natica rotundata ?	Vermetus polygonalis.
„ gaultina.	Ammonites furcatus.

This concludes the notice of the lower greensand formation; and I feel no apology is necessary for having deviated from strictly confining my description to that portion which alone occurs in the Undercliff. The group is too interesting to stop short at any particular point; and with such valuable materials before me as Dr. Fitton's paper, which has demonstrated the identity between the lower beds of greensand and those new formations supposed to have been discovered by the French geologists, and named by them "Terrain Neocomien," I felt no excuse was required for completing the account, although not strictly belonging to the district whose peculiarities I am endeavouring to describe.

I have alluded in a former place to the fine shingle which is found in every little bay and cove throughout this line of coast. Various opinions would seem to exist as to the period of this deposit. Mr. Webster, in a letter to Sir Henry Englefield, dated 1811, says, "Fifty years back there were no shingles to the eastward of Rocken End, but they have now certainly covered the whole of the shore from that place to Bonchurch; and they extend also from Rocken End to Freshwater;" and he remarks also, in the same letter, that the cove below Steephill was covered, twenty years previous to 1811, with fine sand similar to that of Sandown. The information I have been able to obtain from our native fishermen, one of them verging

on 90 years of age, is, that forty years since no *small* shingle existed in Mill Bay, Ventnor, but that the beach was composed of large round pebbles, similar to those which now are found on the beach at Sandown, and in which the many interesting specimens of zoophytic remains are included, so touchingly described in Mantell's beautiful little volume, "Thoughts on a Pebble." From Webster's description, the shingles he alludes to were larger than those which cover the shore at the present time; and the native authority I have just quoted recollects, when a boy, that there were no shingles of the same kind as those found now, to be seen from the Needles eastward. The deposit is in many places very great, and extends occasionally to a depth of ten feet and more in Ventnor Cove. I have no doubt that it is to this cause that the coast at this point has ceased to be encroached upon by the sea in the same way it used to be in former years. Certain it is, that within my own knowledge, the shore about Mill Bay has "made" very much with these ten or eleven years, and the annual wearing away of the soil in that part of the cove called the "Chicken Pits," no longer occurs; and houses have been built, and an esplanade constructed on ground, which, at a former period, the sea appeared inclined to claim as its own. The cliffs below Steephill have been much destroyed during the last few years; but the work of destruction appears to be arrested at the present time; and, I believe, from the same cause which has saved the shores of Mill Bay, namely, the deposit of this shingle, which

increases year by year. The same remark may be applied with respect to the coast between Ventnor and Bonchurch; some of the bold headlands and cliffs (which are composed of chalk, and bear the appearance of being in their original position, though they have no doubt subsided with the whole of the Undercliff far below their proper elevated situation) had suffered for years from the gradual encroachments of the sea, which sapped their softer foundation and brought down huge masses each succeeding season. A shingly beach has now been formed to some depth, and the destruction of many a noble promontory arrested.

The deposition of these shingles is much influenced by the continuance of successive winds, either from eastward or westward, and it is curious to observe the patches of fine sand which succeed their removal.

From the observations I have made on the frequent removal and re-deposition of these pebbly fragments, and the fine sand which now almost invariably follows in the former case, I am inclined to think within a few years our shore may present a very different aspect from that it does at present, and instead of the shingle we shall have within the rocks a beach of sand.

Mr. Webster imagines the shingles to have been derived from the immense bed which exists at the west end of the Solent, nearly opposite Hurst Castle. It is, however, not unreasonable to imagine they are the contributions of various strata covered by the sea, which washes away the softer parts in which they are imbedded, and deposits them on the beach during

boisterous weather; and this opinion is strengthened by the remark of Dr. Mantell, that the small pebbles of pure transparent quartz or rock-crystal which are found here are identical in mineralogical character with those which occur in the grits of Tilgate Forest and Tunbridge Wells, where a geological formation exists similar to that which is found below the Lower Greensand, namely, the Wealden.

HYDROLOGY.

It had been my intention to have introduced here an analytical notice of the springs of the Undercliff; circumstances, however, over which I have had no control, have prevented me from doing more than very briefly adverting to the general properties of the waters met with in the district, and repeating the oft-quoted analysis of the mineral Sand Rock spring by Dr. Marcet.

This district abounds in springs of water of the most pellucid character, affording one of the great necessaries of life of a most agreeable and wholesome nature. If we consider the peculiarity of geological structure given in the pages immediately preceding, we shall at once be prepared to anticipate the various constituents which exist in the waters of this locality. The chalk, with which they first come in contact, would naturally lead us to imagine that they would

contain a notable amount of the base of that mineral, modified, as various chemical affinities take place in their percolations through the different strata of upper greensand, until they finally reach the Gault.

This remark applies more particularly to the central portion of the Undercliff: other combinations take place where the springs rise from the beds of the lower greensand formation, and it is at those points we meet with the mineral water to which I have already alluded in previous chapters.

As the Lower Greensand occurs at each extremity of the Undercliff, we accordingly meet with springs very similar in character at each point, and the water from these sources is found highly impregnated with *iron*, derived from the ferruginous sandstone strata through which it passes; and with *alumina*, from its contact with the beds of argillaceous clay which are dispersed at intervals throughout this formation.

Fashion does not appear always to have led its votaries to the fountains of King Bladud at Bath, to the waters of Tunbridge, Cheltenham, or the hundred and one places of resort of this description existing at the present day. Shanklin, it is related, enjoyed a share of fashionable patronage in the reign of Charles II., when it was resorted to for the purpose of drinking the mineral water of a spring said to have existed there. Its glory has however faded; and I am not aware of any memorial remaining at the present time to point out to the curious the spot where the wits and fashionables of

that period associated for the purpose of recruiting their shattered health, or "killing" that "time" which once lost can never be recalled.

Numerous little springs, trickling from the cliffs throughout the distance from Shanklin to East End, give evidence by their ochreous deposits of their ferruginous character; and a powerful aluminous chalybeate is said to occur at East End; which report, though by no means improbable, I have hitherto been unable to verify, and it is not unlikely that it may have been lost in the common ruin attendant on the Landslips of 1810 and 1818.

The mineral spring, however, which has been brought more prominently before the public of late years, is that situated between Niton and Black Gang, and known under the name of the Sand Rock Spring.

This was discovered by the late Mr. Waterworth of Newport, in the spring of 1809, and was extensively used as a remedy in the debility ensuing on the Walcheren fever and other diseases.

The water was analysed by Dr. Marcet, who gives the following results:—

Three different quantities brought from the spring exhibited the annexed specific gravities:—

1st . .	1008·3
2nd . .	1007·2
3rd . .	1006·9
	3)3022·4
	1007·4 Mean specific gravity.

The chemical constitution is as follows:—

Carbonic acid gas $\frac{3}{10}$ of a cubic inch.

	Grains.
Sulphate of iron	41·4
,, alumina . . .	31·6
,, lime	10·1
,, magnesia . .	3·6
,, soda	16·0
Muriate of soda	4·0
Silica	0·7
	107·4

I have already alluded, in Chapter IV., to the diseases in which this remedy is most applicable; and I feel assured that were the knowledge of its beneficial effects more generally known, Black Gang and its neighbourhood would become much more resorted to in the summer months by invalids in whose cases the use of this water is indicated, than it is at the present time.

CHAPTER VII.

THE BOTANY OF THE UNDERCLIFF.

The Flora of the Undercliff is by no means deficient in the number or in the interest of its species; and although the following list of plants, with their habitats, and frequency of their occurrence, is not presumed to be perfect, yet from the valuable assistance afforded me by my excellent friend, Dr. Bromfield, (whose contemplated Flora of the island will form, from the accuracy as well as the novelty of the descriptions, a standard Botanical work,) I am induced to believe the following notice of the flowering plants and ferns will be found of sufficient exactness to afford a tolerable guide to such of our visitors as may feel inclined to follow the engaging and instructive study of botany.

While endeavouring to arouse in some of my fair friends an interest in a pursuit so attractive, and which forms so pleasing an inducement to healthful exercise, I am often met by the answer, that the names are so hard and difficult as to alarm and discourage those not acquainted with the Greek or Latin languages. Let me assure such the difficulty is one which is easily surmounted by a little common appli-

cation and attention, and when once overcome, a wide field of delightful study is opened, which renders every walk of interest, and which invests every new country that may be visited with far higher attractions than it would otherwise appear to possess.

It will be my endeavour, as much as lies in my power, in the following description, to soften these asperities, and by adding the common English names to plants, assist and encourage the beginner, while it will not render it less useful to the more advanced botanist.

I have thought it better to adhere to the classification according to the Natural system, rather than adopt the Artificial one of Linnæus, as the former is now more generally employed by botanists; and, as the following is but a list of plants, it will be more congenial to those familiar with the subject, while it will not tend to embarrass the learner.

The First Order of the PHANEROGAMEÆ, or FLOWERING PLANTS, is that of the

RANUNCULACEÆ.

This includes the following species*:—

1. Clematis Vitalba. *Traveller's Joy.* Is pro-

* I have omitted to class the various species in each natural order, under their particular Tribes and Genera, as, had such a plan been adopted, I should only have enlarged the list without adding to its utility.

fusely distributed throughout the Undercliff, on rocks, trees, and hedges.

2. Anemone nemorosa. *Wood Anemone.* Is found in thickets and shady places, in various parts of the district.

3. Adonis autumnalis. *Corn Pheasant's Eye.* This beautiful little plant is sometimes plentiful in corn fields above Steephill, and at Bonchurch.

4. Myosurus minimus. *The Common Mouse Tail.* Corn fields and waste places; not rare.

5. Ranunculus Flammula. *Lesser Spear Wort.* Wet places; common.

6. Ranunculus Ficaria. *Pilewort,* or *Lesser Celandine.* Banks and pastures; abundantly.

7. Ranunculus acris. *Upright Meadow Crow Foot.* Meadows, &c.; common.

8. Ranunculus repens. *Creeping Crow Foot.* Meadows and pastures; common.

9. Ranunculus bulbosus. *Bulbous Crowfoot,* or *Butter Cups.* Meadows and pastures; common.

10. Ranunculus arvensis. *Corn Crow Foot.* It is also here called "*Devil's Claw,*" from the shape of its seed vessels. It is often *too* abundant in corn fields in the Undercliff, and from its acrid qualities is considered extremely hurtful to cattle.

11. Ranunculus parviflorus. *Small-flowered Crow Foot.* Corn fields and banks, occasionally. Orchard by the "Crab and Lobster," Ventnor.

12. Ranunculus auricormus. *Goldilocks,* or *Wood Crow Foot*; woods at St. Lawrence.

13. Helleborus fœtidus. *Stinking Hellebore.* Banks and thickets; rare; above the "Crab and Lobster," at Ventnor; on bushy slopes near St. Lawrence, and about Woolverton.

PAPAVERACEÆ.

This order contains seven species:—

1. Papaver Argemone. *Long Rough-headed Poppy.* Corn fields, dry banks and fields; not uncommon, especially when the greensand occurs on the surface.

2. Papaver hybridum. *Round Rough-headed Poppy.* This species, which is usually rare, is not uncommon in various parts of the Undercliff, as corn-fields at Bonchurch, Ventnor, St. Lawrence, &c.

3. Papaver Rhœas. *Common Red Poppy.* Common in corn-fields, here as elsewhere.

4. Papaver dubium. *Long Smooth-headed Poppy.* Found with the last, and scarcely less common.

5. Papaver somniferum. *White Poppy.* This plant frequently comes up spontaneously, where a patch of the greensand formation is newly turned up. It flourishes for a time most luxuriantly, but is rarely persistent in any station.

6. Glaucium luteum. *Yellow Horned Poppy.* Sea-shore, and banks by the sea; frequent at Ventnor.

7. Chelidonium majus. *Common Celadine.* About hedges and waste places, but rare near Ventnor.

Fumariceæ.

1. Fumaria officinalis. *Common Fumitory.* Frequent.

2. Fumaria capreolata. *Rampant Fumitory.* Hedges and banks; Ventnor, by the "Crab and Lobsters" Inn, and in a fence, opposite St. Boniface House.

Cruciferæ.

This order contains many useful and interesting species.

1. Matthiola incana. *Hoary Stock.* Sea-cliffs; rare, but truly wild; under the shore, opposite Steephill Castle, sparingly. This, and the Compton Cliffs, near Freshwater, are the only certain stations in Britain for this very rare plant.

2. Cheiranthus Cheiri. *Common Wallflower.* Walls and rocks; naturalized, but not indigenous.

3. Nasturtium officinale. *Water Cress.* This agreeable esculent is not unfrequent in wet places, especially near Steephill and Bonchurch.

4. Barbarea præcox. *Early Winter Cress.* Banks, and borders of fields, here and there. In some parts of the island the fields are yellow with it, but it does not occur so abundantly in the Undercliff.

5. Cardamine pratensis. *Cuckoo Flower, Ladies' Smock, Common Bitter Cress.* Damp meadows and pastures; abundantly.

6. Cardamine hirsuta. *Hairy Cardamine.* Hedge banks; plentiful.

7. Cardamine sylvatica. *Wood Cardamine.* Woods and shady places. This species is, by some botanists, considered as merely a variety of Cardamine hirsuta.

8. Hesperis matronalis. *Dame's Violet.* Bonchurch; *Turner and Dillwyn, Bot. Guide,* and *J. Curtis, Esq.;* a weed in the grounds at Old Park.

9. Sisymbrium officinale. *Common Hedge Mustard.* A common weed by every road-side.

10. Sisymbrium thalianum. *Common Wall Cress.* Waste places, and cultivated grounds; common.

11. Alliaria officinalis. *Garlick Hedge Mustard, Jack by the Hedge, Sauce alone.* Under hedges, and by road-sides; common.

12. Brassica Napus. *Rape,* or *Coleseed.* Cultivated land.

13. Brassica oleracea. *Wild Cabbage.* Rocks and cliffs by the sea, at Ventnor; very rare.

14. Brassica nigra. *Black Mustard, Common Mustard.* Hedges and banks.

15. Sinapis arvensis. *Field Mustard,* or *Charlock.* A troublesome weed in fields and gardens.

16. Sinapis alba. *White Mustard.* Plentiful about Ventnor and Bonchurch, but not common in the island generally

17. Draba verna. *Common Whitlow-Grass.* Walls, rocks, and banks; one of the earliest harbingers of spring.

18. Lepidium campestre. *Common Mithridate, Pepper Wort.* Cultivated fields and waysides; not uncommon.

19. Lepidium sativum. *Common Garden Cress.* Ventnor Cove; naturalized.

20. Capsella Bursa-pastoris. *Shepherd's Purse.* This very common and troublesome weed seeds and flowers three or four times during the year.

21. Cakile maritima. *Purple Sea Rocket.* Sandy or pebbly shores; in Ventnor Cove, below the Parsonage.

22. Raphanus Raphanistrum. *Wild Radish,* or *Jointed Charlock.* In cultivated lands, amongst corn, turnips, &c.; roadside between Ventnor and St. Lawrence.

Resedaceæ.

1. Reseda Luteola. *Wild Woad, Dyer's Rocket,* or *Yellow Weed.* In chalky pastures, pits, &c.; here and there.

2. Reseda fruticulosa. *Shrubby Base Rocket.* Apparently naturalized in a field near Steephill.

3. Reseda odorata. *Garden Mignonette.* This universal favourite flowers all the winter through in favourable situations, and is apparently naturalized in Ventnor Cove, and some other places in the Undercliff.

Cistineæ.

1. Helianthemum vulgare. *Common Rock Rose.* Common on dry banks, by roadsides, and on chalk hills.

Violaceæ.

1. Viola hirta. *Hairy Violet.* Woods and hedges; grounds at Steephill Castle, and elsewhere.

2. Viola odorata. *Sweet Violet.* Common, but chiefly the variety with white flowers; sometimes lilac. The banks about Bonchurch were formerly covered with this beautiful spring flower; but the building which has lately taken place there has eradicated it from many of its former stations.

3. Viola canina. *Dog's Violet.* Common everywhere, flowering nearly the whole year through.

4. Viola tricolor. *Pansy Violet*, or *Heart's Ease.* It is the variety V. arvensis which occurs in our corn fields here. My friend Dr. Bromfield makes the following comment on this plant: "It is remarkable that the normal form of this species, with the petals longer than the calyx, and which in cultivation affords the endless and beautiful varieties of the pansy, though so common in most parts of the kingdom, is hardly, if at all, to be met with wild in this island."

Polygaleæ.

1. Polygala vulgaris. *Common Milkwort.* Common in pastures, on banks, and in woods; varying with flowers deep blue, pink, or white.

Caryohylleæ.

1. Silene anglica. *English Catchfly.* Corn fields.
2. Silene nutans. *Nottingham Catchfly.* Along

the brow of the cliff, nearly above St. Lawrence; plentiful.

3. Silene inflata. *Bladder Campion.* Pastures and roadsides; abundant.

4. Silene maritima. *Sea Campion*, or *Catchfly.* Rocky ledges; on the cliff behind Mirables, in the part called the "Upper Walks."

5. Silene noctiflora(?). *Night-flowering Catchfly.* Sandy banks; very rare.

6. Lychnis vespertina. *White Campion.* Corn-fields; common.

7. Lychnis diurna. *Red Campion.* Woods and shady places.

8. Lychnis Flos-cuculi. *Meadow Lychnis*, or *Ragged Robin.* Damp boggy places.

9. Lychnis Githago (Agrostemma Githago). *Corn Cockle.* Corn-fields.

10. Sagina procumbens. *Procumbent Pearlwort.* Waste places and walls; common.

11. Spergula arvensis. *Corn Spurrey.* Sandy fields.

12. Arenaria rubra. *Purple Sandwort.* Dry, sandy places about Bonchurch, and at Black Gang.

13. Arenaria marina. *Seaside Spurrey Sandwort.* Plentiful in the last named localities.

14. Arenaria serpyllifolia. *Thyme-leaved Sandwort.* Abundant everywhere.

15. Arenaria trinervis. *Three-nerved Sandwort.* Damp hedges and thickets.

16. Stellaria media. *Common Chickweed*, or *Stitch-*

wort. This well-known little plant is as abundant here as in every other locality. The variety of this species S. apetala, has been found by Mr. Borrer in the neighbourhood of Niton.

17. Stellaria Holostea. *Greater Stitchwort.* Is one of our earliest flowers. I have seen it in flower as early as the middle of January. It is abundant in all our hedges and woods.

18. Stellaria graminea. *Lesser Stitchwort.* Is common in woods, hedges, and grassy places.

19. Cerastium glomeratum. *Broad-leaved Mouse-ear Chickweed.* Pastures and waste places.

20. Cerastium triviale. *Narrow-leaved Mouse-ear Chickweed.* Waste places, by roadsides, pastures, &c.

21. Cerastium semidecandrum. *Little Mouse-ear Chickweed.* In dry places, pastures, banks, &c.

Malvaceæ.

1. Malva sylvestris. *Common Mallow.* Borders of fields, waysides, &c.

2. Malva rotundifolia. *Dwarf Mallow.* Waste places.

3. Lavatea arborea. *Sea Tree Mallow.* Sparingly naturalized, near the mill at Ventnor and in the Cove.

Hypericineæ.

1. Hypericum Androsæmum. *Tutsan.* Woods and thickets; frequent.

2. Hypericum quadrangulum. *Square-stalked St. John's Wort.* Wet places.

3. Hypericum perforatum. *Common perforated St. John's Wort.* Pastures, banks, and woods; common.

4. Hypericum hirsutum. *Hairy St. John's Wort.* Woods and thickets.

5. Hypericum montanum. *Mountain St. John's Wort.* Bushy places; rare. About Steephill; occasionally on a bank at St. Lawrence.

Acerineæ.

1. Acer campestre. *Common Maple.* Woods, thickets, and hedges, abundantly.

2. Acer Pseudo-platanus. *Greater Maple,* or *Sycamore.* Naturalized everywhere. This tree, by the aid of its winged fruit, seeds itself most abundantly throughout the Undercliff, and, in consequence, becomes a troublesome weed in some of our gardens.

Geraniaceæ.

1. Geranium dissectum. *Jagged-leaved Cranesbill.* Hedge banks.

2. Geranium rotundifolium. *Round-leaved Cranesbill.* Pastures and thickets; abundant in several places about St. Lawrence; on a bank by the roadside going up St. Lawrence Shute.

3. Geranium molle. *Doves-foot Cranesbill.* Common in pastures and fields, &c.

4. Geranium lucidum. *Shining Cranesbill.* Walls, rocks, and chalky banks; rare. Abundant on a wall

near " the Orchard," also on a wall between Niton and Blackgang.

5. Geranium columbinum. *Long-stalked Cranesbill.* Dry banks and pastures; not uncommon.

6. Geranium Robertianum. *Stinking Cranesbill,* or *Herb Robert.* Common everywhere in shady places.

7. Erodium cicutarium. *Hemlock Storksbill.* Waste and sandy places.

Lineæ.

1. Linum angustifolium. *Narrow-leaved Pale Flax.* Dry pastures, roadsides, &c.

2. Linum catharticum. *Purging Flax.* Dry hilly pastures; common on the downs; in the Cow Lease.

Oxalideæ.

1. Oxalis Acetosella. *Wood Sorrel.* Woods and shady places about Steephill.

2. Oxalis corniculata. *Yellow procumbent Wood Sorrel.* In the grounds at Steephill.

Celastrineæ.

1. Euonymus Europæus. *Common Spindle Tree.* Frequent in woods and hedges.

Liguminosæ.

1. Ulex Europæus. *Common Furze, Whin,* or *Gorse.* Frequent on banks about Steephill, and on the downs.

2. Ulex nanus. *Dwarf Furze.* Found with the foregoing.

3. Sarothamnus scoparius (cytisus scoparius). *Common Broom.* Bushy pastures and woods; near Niton.

4. Ononis arvensis. *Common Rest-harrow.* Common on banks, &c.

5. Medicago lupulina. *Black Medick* or *Nonsuch.* Dry fields and waste grounds.

6. Medicago maculata. *Spotted Medick.* Meadows and pastures; frequent.

7. Melilotus officinalis. *Common Yellow Melilot.* Thickets on the road-side between St. Lawrence and "Old Park;" shady places in "Old Park."

8. Melilotus leucantha. *White Melilot.* Formerly found between Ventnor and Bonchurch.

9. Trifolium pratenses. *Common Purple Trefoil.* Pastures, &c.; common.

10. Trifolium subterraneum. *Subterraneous Trefoil.* Dry pastures and banks; not unfrequent at Bonchurch, Steephill, &c.

11. Trifolium repens. *White Trefoil* or *Dutch Clover.* Common everywhere.

12. Trifolium fragiferum. *Strawberry-headed Trefoil.* Pastures; not rare.

13. Trifolium procumbens. *Hop Trefoil.* Common.

14. Trifolium minus. *Lesser Yellow Trefoil.* Pastures at Steephill and elsewhere.

15. Lotus corniculatus. *Common Bird's-foot Trefoil.* Pastures, banks; everywhere.

16. Lotus major. *Narrow-leaved Bird's-foot Trefoil.* Wet thickets, ditch-banks, &c.

17. Anthyllis vulneraria. *Common Kidney Vetch* or *Ladies' Fingers.* Pastures; not common at Bonchurch.

Var. A. maritima. *Sea Kidney Vetch.* On the cliffs at Bonchurch near the old church.

18. Astragalus glycyphyllos. *Sweet Milk Vetch.* Stony thickets and pastures; rare. Abundant in rough ground near the "Orchard," between Mount Cleves and West Cliff.

19. Vicia hirsuta. *Hairy Tare.* Corn-fields and cultivated ground.

20. Vicia tetrasperma. *Smooth Tare.* With the foregoing.

21. Vicia gracilis. *Six-seeded Tare.* Hedge-banks at Ventnor; rare.

22. Vicia Cracca. *Tufted Vetch.* Hedges and thickets; abundant.

23. Vicia sepium. *Bush Vetch.* Hedges and woods; common.

24. Vicia sativa. *Common Vetch.* Banks, pastures, and road-sides.

Var. V. angustifolia. *Narrow-leaved Crimson Vetch.* Dry banks about Ventnor.

25. Lathyrus pratensis. *Meadow Vetchling.* Pastures, hedges, &c.; common.

26. Lathyrus sylvestris. *Narrow-leaved Everlasting Pea.* Between the road and Upper Cliff opposite Puckaster; abundant in the Landslip at East End.

27. Lathyrus Nissolia. *Crimson Vetchling* or *Grass Vetch.* Between the Sand Rock Spring and the sea Cliff; tolerably abundant.

28. Ornithopus perpusillus. *Common Bird's-foot.* Sandy or chalky banks; rare.

29. Hippocrepis comosa. *Tufted Horse-shoe Vetch.* Chalky hills, banks, and pastures; profusely about Ventnor, decking the close turf with a brilliant display of rich yellow blossoms.

Rosaceæ.

1. Prunus spinosa. *Black Thorn* or *Sloe.* Thickets and bushy pastures; abundant.

2. Prunus insititia. *Wild Bullace.* Hedges and woods.

3. Prunus domestica. *Wild Plum Tree.* Hedges beyond Steephill and at Bankend. Dr. Bromfield remarks of this species: "I am unable, in common with many others, to point out any character by which this can be distinguished from P. insititia, which in its turn glides imperceptibly into P. spinosa."

4. Prunus Avium. *Wild Cherry.* Grounds at Steephill; naturalized.

5. Spiræa Ulmaria. *Meadow Sweet, Queen of the Meadows.* Moist places; common.

6. Geum urbanum. *Wood Avens, Herb Bennet.* Moist thickets.

7. Poterium Sanguisorba. *Common Salad Burnet.* Abundant on the downs and chalky banks.

8. Agrimonia Eupatoria. *Common Agrimony.* Road-sides and waste places; common.

9. Alchemilla arvensis. *Field Ladies' Mantle* or *Parsley Piert.* Dry waste grounds, fallows, &c.; common.

10. Potentilla anserina. *Silver Weed.* Pastures and way-sides.

11. Potentilla reptans. *Common Creeping Cinquefoil.* By road-sides and on banks; very common.

12. Potentilla Tormentilla. *Trailing Tormentil.* Heathy places and dry woods.

13. Potentilla Fragariastrum. *Barren Strawberry.* One of our earliest spring flowers; hedge-banks.

14. Fragaria vesca. *Wood Strawberry.* In woods and on hedge-banks; frequent.

15. Rubus. *Bramble.* Several of the presumed species, or at least varieties, of this intricate and perplexing genus, inhabit the Undercliff; but Dr. Bromfield has not had the opportunity of supplying me with a list of them with certainty, and I am therefore compelled to omit them in this place.

16. Rosa canina. *Common Dog Rose.* Woods and hedges.

17. Rosa spinosissima. *Burnet-leaved Rose.* Banks between Ventnor and Madeira Vale.

18. Rosa micrantha. *Small-flowered Sweet Briar.* Eastern Acres, near Steephill.

Some other species of this interesting genus also

occur in the district, but I regret I have neglected to identify the particular habitats where they are found.

19. Cratægus Oxyacantha. *Hawthorn, White Thorn,* or *May.* Common everywhere. On the broken ground adjoining Mirables, forming beautiful thickets and trees.

Var. C. monogyna, having the fruit woolly; is found in Pelham Woods.

20. Pyrus Malus. *Crab Apple.* Woods and hedges.

Onagrariæ.

1. Epilobium hirsutum. *Great Hairy Willow Herb.* Common in wet thickets.

2. Epilobium parviflorum. *Small-flowered Hairy Willow Herb.* Damp places, banks of ditches, &c.

3. Epilobium montanum. *Broad Smooth-leaved Willow Herb.* Moist woods, walls, and rocks.

4. Epilobium tetragonum. *Square-stalked Willow Herb.* Damp places, woods, &c.

5. Circæa lutetiana. *Common Enchanters' Nightshade.* Thickets near Woolverton.

Haloragеæ.

1. Callitriche verna. *Vernal Water-star-wort.* Pools and ditches.

Portulaceæ.

1. Montia fontana. *Water Blinks* or *Water Chickweed.* Wet broken ground, near Black Gang.

Paronychieæ.

1. Scleranthus annuus. *Annual Knawel.* Cultivated grounds, amongst corn, &c.; common.

Crassulaceæ.

1. Sedum acre. *Biting Stone Crop* or *Wall Pepper.* Walls, rocks, and sandy ground.

2. Sedum Anglicum. *White English Stonecrop.* Sandy ledges and rocks, near Black Gang.

Grossularieæ.

1. Ribes rubrum. *Common Red Currant.* Hedges and thickets, near "Old Park."

2. Ribes Grossularia. *Gooseberry.* Hedges and woods; not common. Dr. Bromfield believes it to be truly indigenous here.

Umbelliferæ.

1. Hydrocotyle vulgaris. *Common White Rot, Marsh Penny Wort.* Wet boggy places, near Black Gang, &c.

2. Sanicula Europæa. *Wood Sanicle.* Moist thickets and groves; common.

3. Apium graveolens. *Smallage* or *Wild Celery.* Stream side at St. Lawrence; sides of rivulets in boggy ground, near Black Gang.

4. Petroselinum segetum. *Corn Parsley.* Cornfields, hedge-banks, &c.; occasionally.

5. Helosciadium nodiflorum. *Procumbent Marsh Wort.* Everywhere, in ditches and wet springy land.

6. Sison Amomum. *Hedge Bastard Stone Parsley.* Hedge-banks on the chalk; frequent.

7. Ægopodium Podagraria. *Gout-weed* or *Herb Gerarde.* Shady places, but very local. Plentifully in the grounds at Puckaster.

8. Bunium flexuosum. *Common Earth Nut.* Meadows and pastures; abundant.

9. Pimpinella Saxifraga. *Common Burnet Saxifrage.* Very common in clayey pastures.

10. Pimpinella magna. *Greater Burnet Saxifrage.* Said to have been found on a chalky bank near St. Lawrence.

11. Sium angustifolium. *Narrow-leaved Water-parsnip.* Pools and wet places; very rare. Between St. Lawrence and Niton.

12. Œnanthe crocata. *Hemlock Water-Drop Wort.* Ditches and wet boggy thickets. Very common. Reported a plant of great virulence as a poison.

13. Œnanthe pimpinelloides. *Parsley Water-Drop Wort.* Pastures. In some years very abundant all over the Island, in others comparatively rare, as in 1847; very plentiful 1848.

14. Œnanthe Phellandrium. *Fine-leaved Water Drop Wort.* The Rev. Gerard E. Smith believes he has found this plant at Ventnor. Dr. Bromfield, however, has not succeeded in discovering it, either there or in any other part of the Island, although

it is abundant in ditches and pools on the opposite coast.

15. Æthusa Cynapium. *Fool's Parsley*, or *Lesser Hemlock*. Corn fields and weedy gardens; frequent.

16. Fœniculum officinale. *Common Fennel*. Banks and cliffs. On steep banks at the eastern side of Ventnor Cove in plenty.

17. Crithmum maritimum. *Sea Samphire*. Rocks and cliffs. Sea cliffs below St. Lawrence. Rocky ledges behind Bonchurch many hundred yards from the sea.

18. Angelica sylvestris. *Wild Angelica*. Wet woods.

19. Pastinaca sativa. *Wild Parsnip*. Chalky pastures and roadsides.

20. Heracleum Sphondylium. *Cow Parsnip*, or *Hogweed*. Moist woods and pastures.

21. Daucus Carota. *Wild Carrot*. Pastures and roadsides. Very common.

22. Daucus maritimus? *Seaside Carrot*. Sea banks at Bonchurch.

23. Torilis Anthriscus. *Upright Hedge Parsley*. Hedges and waste places between Madeira Vale and the Cow Lease.

24. Torilis infesta. *Spreading Hedge Parsley*. Corn fields. Abundant.

25. Torilis nodosa. *Knotted Hedge Parsley*. Abundant along the road between Bonchurch and Ventnor, in Ventnor Cove, and elsewhere.

26. Scandix Pecten-Veneris. *Needle Chervil, Venus' Comb, Shepherd's Needle, Puck Needle.* Corn fields and cultivated grounds abundantly.

27. Anthriscus sylvestris. *Wild-beaked Parsley.* Hedge banks and borders of fields. Extremely common.

28. Anthriscus vulgaris. *Common beaked Parsley.* Dry sandy banks. Most abundantly on dry earthen fences between Ventnor and Bonchurch.

29. Chærophyllum temulum. *Rough Chervil.* Hedges and waste places.

30. Conium maculatum. *Common Hemlock.* Hedge banks and woods. Dr. Bromfield has seen it *nine feet* high in woods about St. Lawrence.

31. Smyrnium Olusatrum. *Common Alexanders.* Cliffs and banks. Very abundant along the crests of the high banks facing the sea, a little to the eastward of Steephill Castle.

Araliaceæ.

1. Adoxa Moschatellina. *Tuberous Moschatell.* Banks at Bonchurch.

2. Hedera Helix. *Common Ivy.* On rocks, trees, and walls universally, and most luxuriantly.

Corneæ.

1. Cornus sanguinea. *Wild Cornel,* or *Dogwood.* Woods and hedges. Abundantly.

Caprifoliaceæ.

1. Sambucus Ebulus. *Dwarf Elder* or *Dane Wort.* Bank on the side of the road leading to the Light House.

2. Sambucus nigra. *Common Elder.* Woods, hedges, and thickets, abundantly everywhere.

3. Viburnum Lantana. *Mealy Guelder Rose,* or *Wayfaring Tree.* Extremely common in hedges and thickets throughout the Undercliff.

4. Viburnum Opulus. *Common Guelder Rose* or *Water Elder.* Damp thickets; less frequent than the last.

5. Lonicera Periclymenum. *Common Honeysuckle, Woodbine.* Woods and hedges, luxuriantly everywhere.

Rubiaceæ.

1. Sherardia arvensis. *Blue Sherardia* or *Field Madder.* Corn fields and waste places. Common.

2. Asperula cynanchica. *Small Woodruff, Squinancy Wort.* Chalky banks, downs, &c. Very fine and abundant about Ventnor.

3. Asperula odorata. *Sweet Woodruff.* Thickets opposite the orchard at Bonchurch.

4. Galium palustre. *White Water Bedstraw.* Wet places.

5. Galium cruciatum. *Crosswort Bedstraw, Mugwort.* Hedge banks and thickets.

6. Galium Mollugo. *Great Hedge Bedstraw.* Common in hedges.

7. Galium verum. *Common Bedstraw.* Dry banks. Common.

8. Galium tricorne. *Rough-fruited Corn Bedstraw.* Corn fields, St. Lawrence. Not very common, but occasionally abundant in particular places.

9. Galium Aparine. *Goose Grass* or *Cleavers.* Hedges, fences, &c. Plentiful.

10. Rubia peregrina. *Wild Madder.* Profusely, in hedges and on rocky banks at Bonchurch, Ventnor, Steephill, Bankend, &c.

Valerianeæ.

1. Centranthus ruber. *Red Valerian.* Naturalized on walls, rocks, and cliffs, at Ventnor and Old Park.

2. Fedia olitoria. *Small Corn Salad* or *Lamb's Lettuce.* Banks, borders of fields, and cultivated ground.

3. Fedia dentata. *Smooth narrow-fruited Corn Salad.* Among corn, often abundant.

4. Fedia Auricula. *Sharp-fruited Corn Salad.* With the last, but less frequent in general.

Dipsaceæ.

1. Dipsacus sylvestris. *Wild Teasel.* Wet thickets, damp pastures, and ditch banks. Common.

2. Knautia arvensis. *Field Knautia.* Borders of fields and amongst corn. Very common.

3. Scabiosa succisa. *Devil's Bit Scabious.* Damp and heathy pastures.

4. Scabiosa Columbaria. *Small Scabious.* Chalky banks. Common.

Compositæ.

1. Eupatorium cannabinum. *Hemp Agrimony.* Damp pastures and hedge banks. Very common.

2. Tussilago Farfara. *Coltsfoot.* Pastures and meadows.

3. Bellis perennis. *Common Daisy.* Everywhere most abundant.

9. Solidago Virgaurea. *Golden Rod.* Woods and thickets. In a furze-brake between Steephill and St. Lawrence.

5. Inula Conyza. *Plowman's Spikenard.* Chalky banks and woods. Frequent at Bonchurch, Ventnor, Steephill, and St. Lawrence.

6. Inula Helenium. *Elecampane.* In the broken ground at East End.

7. Pulicaria dysenterica. *Fleabane.* Roadsides and pastures. Plentiful.

8. Anthemis Cotula. *Stinking Chamomile, Morgan* or *Morgin.* A too plentiful weed in corn fields and elsewhere. It possesses acrimonious properties, and sometimes produces blisters and troublesome sores on reapers and others.

9. Anthemis nobilis. *Common Chamomile.* Damp pastures, occasionally.

10. Achilleæ Millefolium. *Yarrow* or *Milfoil.* Roadsides, margin of fields, lawns, &c. abundant.

11. Chrysanthemum Leucanthemum. *Great White Oxeye.* Dry pastures and banks.

12. Chrysanthemum segetum. *Corn Marigold, Yellow Oxeye.* Corn fields. Not common. Between Steephill and St. Lawrence.

13. Pyrethrum Parthenium. *Common Feverfew.* About hedges and waste places. Not common, and probably introduced. Near Steephill and at St. Lawrence, by the roadside, before coming to the church.

14. Pyrethrum inodorum. *Corn Feverfew* or *Scentless Mayweed.* Corn fields, waste places, and roadsides. Common.

15. Pyrethrum maritimum. *Sea-side Feverfew.* Banks, walls, &c., by the sea beach. Dr. Bromfield does not think this species distinct from the foregoing.

16. Artemisia Absinthium. *Common Wormwood.* Dry waste places, and by roadsides. Abundant at Bonchurch, and under the cliffs at St. Lawrence, and between there and Niton. Not general in the Island.

17. Artemisia vulgaris. *Mugwort.* Dry hedges and bushy places.

18. Filago germanica. *Common Cudweed.* Corn fields and cultivated lands.

19. Gnaphalium uliginosum. *Marsh Cudweed.* Damp places. Near Black Gang. Not frequent.

20. Senecio vulgaris. *Common Groundsel.* A too frequent weed in gardens and cultivated grounds.

21. Senecio tenuifolius. *Hoary Ragwort.* Roadsides and thickets common.

22. Senecio Jacobœa. *Common Ragwort.* Damp meadows and pastures.

23. Senecio aquaticus. *Marsh Ragwort.* Wet meadows and ditch-banks.

24. Carlina vulgaris. *Common Carline Thistle.* Frequent on the downs.

25. Centaurea nigra. *Black Knapweed.* Waysides, pastures, &c.; common; var. C. radiata, C. nigrescens of some botanists, Dr. Bromfield states as being the prevailing form of this species in the Island generally. It is extremely common in the Undercliff.

26. Centaurea cyanus. *Corn Blue Bottle.* Cornfields; common.

27. Centaurea Scabiosa. *Great Knapweed.* Cornfields and borders of fields; common on the chalk.

28. Centaurea solstitialis. *Yellow Star Thistle, St. Barnaby's Thistle.* Amongst Lucerne, in a field above Bonchurch, Dr. Bromfield received a specimen from Rev. Gerard E. Smith from the above locality.

29. Arctium Lappa. *Common Burdock.* Borders of fields and roadsides; frequent.

30. Carduus nutans. *Musk Thistle.* Plentiful on the chalk in open situations.

31. Carduus tenuiflorus. *Slender-flowered Thistle.* Frequent; abundant underneath the cliffs towards Niton in various places.

32. Carduus (Cnicus) lanceolatus. *Spear Plume Thistle.* Common.

33. Carduus (Cnicus) eriophorus. *Woolly-headed Plume Thistle.* Rare; frequent in the Landslip at Bonchurch, and occasionally at Bonchurch itself.

34. Carduus (Cnicus) arvensis. *Creeping Plume Thistle.* Common in cultivated fields.

35. Carduus (Cnicus) palustris. *Marsh Plume Thistle.* Common in wet pastures, damp thickets, &c.

36. Carduus (Cnicus) acaulis. *Dwarf Plume Thistle.* Very common on the downs, and dry chalky pastures.

37. Silybum marianum. *Milk Thistle, Holy Thistle.* Not common; truly wild under the cliffs at Bonchurch, and behind Mirables: at Woolverton.

38. Serratula tinctoria. *Common Saw-wort.* Hedge-side, near Bonchurch; rare.

39. Lapsana communis. *Common Nipplewort.* Banks and waste places; very common.

40. Cichorium Intybus. *Wild Succory.* Fields near St. Lawrence; G. S. Gibson, Esq.

41. Hypochœris radicata. *Long-rooted Cat's-ear.* Pastures and meadows; very abundant.

42. Thrincia hirta. *Hairy Thrincia.* Common in pastures.

43. Leontondon (Apargia) hispidum. *Rough Hawkbit.* Dry banks and waste places.

44. Oporinia (Apargia) autumnalis. *Autumnal Hawkbit.* Dry pastures, &c.

45. Tragopogon pratensis. *Yellow Goat's-beard.* Banks and meadows.

46. Picris hieracioides. *Hawkweed Picris.* Chalky banks; but not general. Very common at Ventnor in the cove, and elsewhere.

47. Helminthia echioides. *Bristly Ox-tongue.* Woods, hedges, and pastures. Much more general and abundant than the last.

48. Taraxacum officinale. *Common Dandelion.* Pastures, roadsides, &c.; universally.

49. Crepis virens. *Smooth Hawk's-beard.* Hedge-banks, and fields; everywhere.

50. Sonchus oleraceus. *Common Sow Thistle.* Gardens and waste places; very common.

51. Sonchus asper. *Rough Sow Thistle.* Waste ground at Steephill.

52. Sonchus arvensis. *Corn Sow Thistle.* Fields at Ventnor.

53. Hieracium Pilosella. *Common Mouse Ear, Hawkweed.* Dry banks and pastures; very plentiful.

54. Hieracium umbellatum. *Narrow-leaved Hawkweed.* Glebe at St. Lawrence.

Campanulaceæ.

1. Jasione montana. *Annual Sheep's bit*, or *Sheep's Scabious.* Dry sandy banks at Black Gang.

2. Campanula rotundifolia. *Round-leaved Bell Flower* or *Hare Bell.* Chalky banks about Ventnor, and beyond St. Lawrence.

3. Specularia hybrida. *Corn Bell Flower.* Amongst corn at St. Lawrence, cultivated ground, and chalky banks, about Ventnor and elsewhere.

Ericaceæ.

1. Erica cinerea. *Fine-leaved Heath.* Downs, and dry pastures.

2. Calluna vulgaris. *Common Ling.* St. Boniface down, and elsewhere.

3. Vaccinium Myrtillus. *Bilberry* or *Whortleberry.* Downs above Ventnor; plentiful.

Ilicineæ.

1. Ilex Aquifolium. *Common Holly.* Woods and hedges; not common in the Undercliff.

Oleaceæ.

1. Ligustrum vulgare. *Privet.* Woods and hedges; plentiful.

2. Fraxinus excelsior. *Common Ash.* Woods and hedges; common.

Apocyneæ.

1. Vinca major. *Greater Periwinkle.* Naturalized at Steephill, and near St. Lawrence.

Gentianaceæ.

1. Chlora perfoliata. *Yellow Wort.* Chalky banks and pastures not uncommon.

2. Erythræa pulchella. *Dwarf-branched Centuary.* Pastures and banks on the downs.

3. Erythræa Centaurium. *Common Centuary.* Dry banks and chalky slopes.

4. Gentiana Amarella. *Autumnal Gentian.* Dry chalky banks and pastures; in the Cow Lease.

5. Gentiana campestris. *Field Gentian.* Downs above Steephill, and elsewhere.

Convolvulaceæ.

1. Convolvulus Sepium. *Great Bindweed.* Moist hedges and thickets; common.

2. Convolvulus arvensis. *Small Bindweed.* Everywhere too abundant. The difficulty of eradicating this plant in our gardens renders it the most troublesome weed with which we are infested.

3. Cuscuta Epithymum. *Lesser Dodder,* on furze and thyme.

Boragineæ.

1. Cynoglossum officinale. *Common Hound's-tongue.* Pastures and waste grounds.

2. Borago officinalis. *Common Borage.* Waste places at Bonchurch, Ventnor, and St. Lawrence, probably the outcast of gardens.

3. Lycopsis arvensis. *Small Bugloss.* Roadside near Mirables.

4. Echium vulgare. *Viper's Bugloss.* Dry chalky banks near Whitwell Shute.

5. Lithospermum officinale. *Common Gromwell, Grey Mill* or *Grey Millet.* Pastures and thickets.

6. Lithospermum arvense. *Corn Gromwell* or *Bastard Alkanet.* Corn-fields; frequent.

7. Myosotis arvensis. *Field Scorpion Grass.* Fields and woods; common.

8. Myosotis versicolor. *Yellow and blue Scorpion Grass.* Dry banks, &c.

9. Myosotis cœspitosa. *Tufted Water Scorpion Grass.* Near Woolverton.

Solanaceæ.

1. Solanum Dulcamara. *Woody Nightshade* or *Bitter Sweet.* Hedges and thickets; frequent.

2. Solanum nigrum. *Common* or *Garden Nightshade.* Waste places and gardens.

3. Hyoscyamus niger. *Common Henbane.* Waste ground at Bonchurch, Ventnor, and St. Lawrence; abundant a few years since.

4. Datura Stramonium. *Common Thorn Apple.* Gardens and waste places. Bonchurch and Ventnor; rare.

5. Verbascum Thapsus. *Great Mullein.* Common in chalky banks, and by roadsides.

6. Verbascum Blattaria. *Moth Mullein.* Var., at Steephill, with white flowers; scarcely wild.

Orobancheæ.

1. Orobanche minor. *Lesser Broom-rape.* Fields, chiefly on clover.

2. Orobanche Hederæ. *Ivy Broom-rape.* Abundant on ivy below the rocks at Steephill, in Pelham Woods, &c.

3. Orobanche cærulea. *Purple Broom-rape.* Steephill. This is given on the authority of Pulteney. Dr. Bromfield has never found it in the Undercliff; but, as it occurs on the greensand formation along the eastern coast of the Island, it may probably have been found in the above-mentioned locality.

Scrophularineæ.

1. Digitalis purpurea. *Purple Foxglove.* Hedge-banks and woods; between Niton and St. Lawrence; var. with white flowers at Steephill.

2. Antirrhinum Orontium. *Lesser Snapdragon.* Steephill.

3. Linaria cymbalaria. *Ivy-leaved Toadflax.* Naturalized on walls and banks; abundantly at Ventnor, St. Lawrence, The Orchard, &c.

4. Linaria Elatine. *Sharp-pointed Fluellen*, or *Toadflax.* Plentiful in cultivated and waste grounds.

5. Linaria spuria. *Round-leaved Fluellen*, or *Toadflax.* With the last; common.

6. Linaria minor. *Least Toadflax.* Quarry at Ventnor.

7. Linaria vulgaris. *Yellow Toadflax.* Common.

8. Linaria purpurea. *Purple Toadflax.* Partially naturalized; on waste grounds and walls at Bonchurch.

9. Scrophularia nodosa. *Knotted Figwort.* Damp woods and hedges; frequent.

10. Scrophularia aquatica. *Water Figwort*, or *Water Betony.* Wet places, ditch-banks, and sides of streams.

11. Melampyrum arvense. *Purple Cow-wheat*, or *Poverty weed.* Grassy slopes on the cliffs above St. Lawrence; and thence, but more sparingly, eastward to Bonchurch. A showy but pestilent weed in the cornfields at the back of the Undercliff as far as Whitwell.

12. Melampyrum pratense. *Yellow Cow-wheat.* Thickets, between Wrongs and Old Park.

13. Pedicularis sylvatica. *Pasture Lousewort*, or *Dwarf Red Rattle.* Pastures; frequent.

14. Rinanthus crista-galli. *Common Yellow Rattle.* Pastures, both moist and dry; Chalk downs and slopes at Bonchurch and Ventnor, &c.

15. Euphrasia officinalis. *Common Eyebright.* Pastures, downs, and heathy places.

16. Euphrasia odontites. *Red Bartsia*, or *Eyebright.* Abundant amongst corn and in the margins of fields.

17. Veronica anagallis. *Water Speedwell.* By the pond at St. Lawrence.

18. Veronica beccabunga. *Brooklime.* Brooks and wet places.

19. Veronica chamædrys. *Germander Speedwell.* Hedges and banks, &c. With flowers nearly white at Steephill.

20. Veronica officinalis. *Common Speedwell.* Grounds at Steephill.

21. Veronica serpyllifolia. *Thyme-leaved Speedwell.* Fields, pastures, &c.; very common.

22. Veronica arvensis. *Wall Speedwell.* Banks and walls at Ventnor, &c.

23. Veronica agrestis. *Green procumbent Field-Speedwell.* Cultivated fields and waste places; common.

24. Veronica polita. *Grey procumbent Field-Speedwell.* With the last, of which it is scarcely more than a variety.

25. Veronica hederifolia. *Ivy-leaved Speedwell.* Abundant in cornfields and waste places, in the spring.

Labiatæ.

1. Mentha rotundifolia. *Round-leaved Mint.* Damp pastures; very common over a great part of the Undercliff, especially towards the western extremity.

2. Mentha viridis. *Spear Mint.* By the side of a brook running to the sea, at St. Lawrence, in considerable plenty, but probably brought down by the stream from a kitchen garden through which it flows.

3. Mentha aquatica. *Capitate,* or *Hairy Mint.* Wet places; frequent.

4. Mentha arvensis. *Corn Mint.* Cultivated fields and waste places.

5. Salvia verbenaca. *Wild English Clary,* or *Sage.*

Dry banks and waste places: frequent at Bonchurch and elsewhere.

6. Origanum vulgare. *Common Marjorum.* Abundantly on chalky banks and roadsides; most luxuriantly under the cliffs between Mirables and The Orchard.

7. Thymus serpyllum. *Wild Thyme.* Dry banks; common.

8. Calamintha officinalis. *Common Calamint.* Under the cliffs at Bonchurch.

9. Calamintha acinos. *Basil Thyme.* Fields; not unfrequent.

10. Calamintha Clinopodium. *Wild Basil.* Along hedges; frequent.

11. Prunella vulgaris. *Self-heal.* Pastures and meadows; common.

12. Nepeta Cataria. *Cat Mint.* Chalky banks and hedges; rare; in several places about Bonchurch and Ventnor, but sparingly.

13. Glechoma hederacea. *Ground Ivy.* Hedge-banks, thickets, &c.; plentiful.

14. Lamium purpureum. *Red Dead-nettle.* Waste and cultivated land; very common.

15. Lamium amplexicaule. *Henbit Nettle.* Waste and cultivated grounds.

16. Lamium album. *White Dead-nettle.* Borders of fields and waste places.

17. Lamium Galeobdolon. *Yellow Weasel Snout,* or *Archangel.* Shady woods and thickets; Steephill and St. Lawrence; flowering occasionally very early in the year.

18. Galeopsis Ladanum. *Red Hemp-nettle.* Chalky fields; abundant along the Undercliff in many places.

19. Galeopsis Tetrahit. *Common Hemp-nettle.* Woods and waste places.

20. Stachys betonica. *Wood Betony.* Woods and thickets.

21. Stachys sylvatica. *Hedge Woundwort.* Damp thickets.

22. Stachys palustris. *Marsh Woundwort.* Wet places, and in moist cornfields.

23. Stachys arvensis. *Corn Woundwort.* Cornfields, and waste grounds.

24. Ballota nigra. *Black Horehound.* Hedges and waste places; common. It has been gathered with white flowers at St. Lawrence.

25. Marrubium vulgare. *White Horehound.* Waste places and chalky pastures; Bonchurch. Most common in the island on the high downs.

26. Teucrium scorodonia. *Wood Germander,* or *Sage.* Dry hedges and thickets; abundantly.

27. Ajuga reptans. *Common Bugle.* Woods; common.

Verbenaceæ.

1. Verbena officinalis. *Common Vervain.* Dry banks, pastures; not rare. St. Lawrence and other places.

Primulaceæ.

1. Primula vulgaris. *Common Primrose.* Common: in woods and hedge-banks.

2. Primula veris. *Common Cowslip.* Meadows, pastures, banks, &c.

3. Primula elatior. *Oxlip Primrose.* Common, with the last, in chalky pastures; Ventnor, Steephill, &c.

4. Lysimachia nemorum. *Yellow Pimpernel,* or *Wood Loosestrife.* Moist shady places.

5. Anagallis arvensis. *Scarlet Pimpernel,* or *Poor Man's Weather Glass.* Waysides and waste places; common. Var. A. cœrulea. Has been found both at Bonchurch and Ventnor.

6. Anagallis tenella. *Bog Pimpernel.* In spongy bogs and wet places; Black Gang.

7. Samolus Valerandi. *Brook-weed,* or *Water Pimpernel.* Watery places by sides of small streams; Wolverton, St. Lawrence, Black Gang.

Plumbagineæ.

1. Armeria maritima. *Common Thrift.* Banks, cliffs, and pastures by the sea; Bonchurch, Blackgang, &c.; plentiful.

Plantagineæ.

1. Plantago major. *Greater Plantain.* Pastures and waysides; common.

2. Plantago media. *Hoary Plantain.* Abundant in pastures on the chalk.

3. Plantago lanceolata. *Ribwort Plantain.* Common by waysides, in fields, meadows, &c.

4. Plantago coronopus. *Buck's-horn Plantain.* On the sea-cliffs; common.

Chenopodiaceæ.

1. Chenopodium polyspermum. *Many-seeded Goosefoot.* Waste and cultivated places occasionally.

2. Chenopodium album. *White Goosefoot.* Waste and cultivated ground; abundant.

3. Chenopodium murale. *Nettle-leaved Goosefoot,* Steephill; under rocks a little west of St. Lawrence.

4. Chenopodium Bonus Henricus. *Mercury Goosefoot,* or *Good King Henry.* Near Wolverton.

5. Beta maritima. *Sea Beet.* Common on the ledges of rocks at Bonchurch, Steephill, and most parts along the Undercliff.

6. Atriplex patula. *Spreading Halberd-leaved Orache.* Waste grounds. A very fleshy-leaved and glaucous form of this plant is common all along the coast.

7. Atriplex angustifolia. *Spreading Narrow-leaved Orache.* Waste places.

8. Atriplex laciniata. *Frosted Sea Orache.* Dr. Bromfield believes he found this species, some years ago, at Ventnor Cove. It occurs in Sandown Bay, and at Yarmouth, but is not common in the island.

Polygonaceæ.

1. Rumex glomeratus (R. acutus). *Sharp Dock.* Common.

2. Rumex sanguineus. *Bloody-veined Dock,* and Var. R. virides, *Green-veined Dock.* Roadsides, &c.; very common.

3. Rumex pulcher. *Fiddle Dock.* Waste grounds, here and there; common.

4. Rumex obtusifolius. *Broad-leaved Dock.* Waste ground.

5. Rumex crispus. *Curled Dock.* Waste places.

6. Rumex acetosa. *Common Sorrel.* Pastures, &c.; abundant.

7. Rumex Aceto sella. *Sheep's Sorrel.* Pastures, banks, &c.; abundant.

8. Polygonum Bistorta. *Bistort,* or *Snakeweed.* Naturalized about Old Park.

9. Polygonum Persicaria. *Spotted Persicaria.* Rich moist grounds.

10. Polygonum Hydropiper. *Biting Persicaria.* Damp places; common.

11. Polygonum aviculare. *Knot Grass.* Fields and roadsides; everywhere.

12. Polygonum convolvulus. *Climbing Buckwheat.* Gardens and cultivated fields.

Thymeleæ.

1. Daphne Laureola. *Spurge Laurel.* Near Steephill. Thickets at Bonchurch, very rare in the Undercliff, but frequent about Ryde.

Santalaceæ.

1. Thesium humifusum (T. linophyllum). *Lint-leaved Bastard Toadflax.* Abundant and most luxuriant on the shelving banks in Ventnor Cove, and similar localities in the Cow Lease.

Euphorbiaceæ.

1. Euphorbia helioscopia. *Sun Spurge.* Waste garden ground, corn-fields, &c.; common.

2. Euphorbia Peplus. *Petty Spurge.* With the last in some places, but less common.

3. Euphorbia platyphylla. *Broad-leaved Warted Spurge.* Corn-fields; occasionally.

4. Euphorbia amygdaloides. *Wood Spurge.* Thickets, hedges, and pastures; very common.

5. Euphorbia exigua. *Dwarf Spurge.* Gardens and cultivated grounds; common.

6. Mercurialis perennis. *Perennial,* or *Dog's Mercury.* Woods and thickets; common.

7. Mercurialis annua. *Annual Mercury.* Ventnor; rare.

Urticaceæ.

1. Parietaria officinalis. *Pellitory of the Wall.* Rocky banks, occasionally at St. Lawrence.

2. Urtica dioica. *Great Nettle.* Woods, hedges, and roadsides; everywhere.

3. Urtica urens. *Small Nettle.* Waste grounds, dunghills, &c.

4. Humulus Lupulus. *Common Hop.* Very frequent in hedges and thickets, at Steephill, St. Lawrence, &c. A truly indigenous plant in the island.

5. Ulmus suberosa. *Cork-barked Elm.* Not common in the Undercliff, though so abundant over the rest of the Island; principally at Bonchurch, but scarcely seeming to be indigenous.

AMENTACEÆ.

1. Salix, or *Willow Tribe.* I am unable to give a list of the species of this most troublesome and difficult genus. The few really indigenous are chiefly of the *Sallow* group, as Salix capræa, *Great Round-leaved Sallow,* and its allies, probably S. aurita, *Round-leaved Sallow,* and S. cinerea, *Grey Sallow.* The dry nature of the district is in general adverse to the growth of willows.

2. Quercus Robur. *Common British Oak.* Woods, &c.; abundant.

3. Corylus Avellana. *Hazel Nut.* Hedge-rows and thickets; plentiful.

This concludes the first great class of flowering plants, termed DICOTYLEDONES, or trees and plants having stems formed of bark, wood, and pith, and increasing *externally,* the seed being made up of two portions, or cotyledons, which expand during germination into leaves.

The Second Class includes the MONOCOTYLEDONES, or plants and trees which increase by the addition of new matter at the centre, and possess but one cotyledon, or, if more, they are alternate.

We shall now proceed to enumerate the different species found in the Undercliff, under their appropriate orders.

Tameæ.

1. Tamus communis. *Black Bryony.* Hedges and thickets; common. The large red fleshy berries may be seen adorning our hedges in festoons during the autumn.

Orchideæ.

1. Orchis morio. *Green-winged Meadow Orchis.* Pastures and meadows; a common species.

2. Orchis mascula. *Early Purple Orchis.* Moist meadows and pastures; frequent.

3. Orchis ustulata. *Dwarf Dark-winged Orchis.* On the slopes of the downs at St. Boniface; chalky banks and pastures between Steephill and Ventnor; not unfrequent.

4. Orchis maculata. *Spotted Palmate Orchis.* Woods, fields, and meadows; very common.

5. Orchis latifolia. *Marsh Orchis.* Moist meadows near Steephill.

6. Orchis pyramidalis. *Pyramidal Orchis.* Very frequent in dry, hilly, chalky pastures and downs, at Bonchurch, Ventnor, &c.

7. Gymnadenia conopsea. *Fragrant Gymnadenia.* Chalky pastures, both wet and dry, but not common. In the Chicken Pits at Ventnor.

8. Habenaria chlorantha. *Yellow Butterfly Habenaria.* Frequent in shady woods and thickets.

9. Ophrys apifera. *Bee Orchis.* Chalky banks,

pastures, and woods; Ventnor, Bonchurch, St. Boniface Down, Steephill, &c.; not uncommon.

10. Ophrys aranifera. *Spider Orchis.* Pastures on the chalk; very rare; near Bonchurch, and in the Landslip.

11. Spiranthes autumnalis. *Fragrant Lady's Tresses.* Fields and pastures in various parts of the Undercliff.

12. Listera ovata. *Common Tway-blade.* Damp woods, thickets; not unfrequent.

13. Epipactis latifolia. *Broad-leaved Helleborine.* Woods and thickets. Landslips at East End, Steephill.

14. Epipactis palustris. *Marsh Helleborine.* Marshy wet places. Black Gang and East End.

Irideæ.

1. Iris Pseud-acorus. *Yellow Water Iris* or *Corn Flag.* Wet meadows, pastures, and low watery grounds.

2. Iris fœtidissima. *Stinking Iris.* Abundant on banks and in woods throughout the entire Undercliff.

Amaryllideæ.

1. Narcissus biflorus. *Pale Narcissus.* In a meadow at Steephill sparingly, and possibly the outcast of a garden; but I found it formerly in the Grove at Ventnor, apparently truly wild; and its occurrence in some other places in the island, as near W. Cowes,

abundantly gives a colour to its being a truly indigenous plant.

2. Narcissus Pseudo-Narcissus. *Common Daffodil.* I used to find this plant in thickets on the slopes and banks behind the Ventnor Hotel; but I have not met with it of late years.

3. Galanthus nivalis. *Common Snowdrop.* This graceful little plant occurs rather abundantly in hedges and thickets between Black Gang and Chale.

Asparageæ.

1. Ruscus aculeatus. *Butcher's Broom.* Woods, occasionally.

Liliaceæ.

1. Ornithogalum umbellatum. *Star of Bethlehem.* Pastures near Steephill, apparently truly indigenous.

2. Allium vineale. *Crow Garlick.* At Steephill, Pelham Woods, &c.

3. Agraphis nutans (Hyacinthus nonocriptus). *Wild Hyacinth* or *Blue Bell.* Abundant in woods, thickets, and pastures.

Juncaceæ.

1. Juncus euffsus. *Soft Rush.* Common in damp sterile pastures.

2. Juncus glomeratus. *Common Rush.* With the foregoing, and equally common.

3. Juncus obtusiflorus. *Blunt-flowered Jointed*

Rush. Wet and boggy places, rare; on wet broken land between Niton and Black Gang.

4. Luzula campestris. *Field Wood Rush.* Common in pastures.

5. Luzula pilosa. *Broad-leaved Hairy Wood Rush.* Woods and thickets; frequent.

6. Luzula Forsteri. *Narrow-leaved Hairy Wood Rush.* Thickets at Steephill.

Alismaceæ.

1. Alisma Plantago. *Greater Water Plantain.* Old Park.

2. Triglochin palustre. *Marsh Arrow Grass.* Sides of small streams at Black Gang.

Aroideæ.

1. Sparganium ramosum. *Branched Bur-reed.* Banks of ditches.

2. Arum maculatum. *Cuckow-pint* or *Wake Robin.* Abundant throughout the Undercliff generally.

Potamogetoneæ.

1. Potamogeton. *Pondweed.* Few ponds, or other places fitted for the growth of this tribe of plants, occur in the Undercliff; and though some species belonging to it may doubtless be found, I regret I am unable to enumerate them.

Cyperaceæ.

1. Cyperus longus. *Sweet Cyperus* or *English Galingale.* Marsh near Puckaster, abundantly.

2. Eleocharis palustris. *Creeping Spike Rush.* Wet places.

3. Scirpus Savii. *Savis' Club Rush.* Wet places: between Knowle and Black Gang, but not common.

4. Carex vulpina. *Great Carex.* Wet places, sides of ditches, and streams.

5. Carex muricata. *Greater Prickly Carex.* Marshy spots about Black Gang.

6. Carex remota. *Remote Carex.* Shady places.

7. Carex stellulata. *Little Prickly Carex.* Black Gang, Pelham Woods.

8. Carex flava. *Yellow Carex.* Wet places near Black Gang.

9. Carex distans. *Loose Carex.* On the shore between Knowle and Rocken End.

10. Carex panicea. *Pink-leaved Carex.* Common in heathy pastures.

11. Carex sylvatica. *Pendulous Wood Carex.* Woods and thickets; common.

12. Carex pendula. *Great Pendulous Carex.* Damp marshy places. Landslip at Bonchurch.

13. Carex Pseudo-Cyperus. *Cyperus-like Carex.* Wet marshy places, and sides of ditches. Rare. By a small stream between Niton and Black Gang, in some abundance.

14. Carex precox. *Vernal Carex.* St. Boniface Down, at Steephill, &c.

15. Carex glauca (C. Recurva). *Glaucus Heath Carex.* Pastures, &c. Everywhere.

16. Carex hirta. *Hairy Carex.* Moist places. Plentiful in a little pond at Steephill.

17. Carex paludosa. *Lesser Common Carex.* Meadows at Steephill.

18. Carex Œderi. *Œderian Carex.* Moist places near Black Gang.

19. Carex arenaria. *Sea Carex.* Sandy banks at Black Gang.

Gramineæ.

1. Anthoxanthum odoratum. *Sweet-scented Vernal Grass.* Meadows and pastures. Abundant.

2. Phleum pratense. *Common Cat's tail Grass, Timothy Grass.* Meadows and pastures. Plentiful.

3. Alopecurus pratensis. *Meadow Fox-tail Grass.* Meadows and pastures. Very common.

4. Alopecurus agrestis. *Slender Fox-tail Grass.* Corn fields and other cultivated ground. A troublesome agricultural weed, the *Black Grass* of the Isle of Wight farmer.

5. Gastridium lendigerum. *Awned nit Grass.* Corn fields and waste ground, where this beautiful southern grass is not uncommon, but not constant to its station.

6. Agrostis setacea. *Bristle-leaved Bent Grass.* Dry turfy downs. The staple grass of most downs in

the island, forming a fine, short, elastic turf, known here as *Rabbit Grass* or *Deer's-foot Grass.*

7. Agrostis canina. *Brown Bent Grass.* Dry pastures and woods. Common.

8. Agrostis vulgaris. *Fine Bent Grass.* With the above.

9. Phragmites communis (Arundo Phragmites). *Common Reed.* Extremely abundant on wet, slipped land, all along the coast *.

10. Aira cæspitosa. *Turfy Hair Grass.* Woods. Common.

11. Aira caryophyllea. *Silvery Hair Grass.* Downs above Steephill.

12. Avena flavescens. *Yellow Oat Grass.* Dry pastures.

13. Avena pratensis. *Narrow-leaved Oat Grass.* Dry chalky banks and pastures.

14. Avena pubescens. *Downy Oat Grass.* With the above.

15. Avena fatua. *Wild Oat.* Corn fields, often very abundantly.

16. Avena strigosa. *Bristle-pointed Oat.* Steephill. Not indigenous.

17. Arrhenatherum avenaceum. *Common Oat-like Grass.* Hedge-banks and borders of fields; common.

* A singular form of this species, with trailing stems of immense length, is found on the shore at Puckaster, &c., and is mentioned, with the station, in the third edition of Ray's Synopsis, by his editor Dillenius, as a plant unknown to the latter.—*Dr. Bromfield.*

18. Holcus lanatus. *Meadow Soft Grass.* Moist woods and pastures.

19. Holcus mollis. *Creeping Soft Grass.* Pastures and hedge-sides.

20. Kœleria cristata (Aira cristata). *Crested Hair Grass.* Along the top of the cliffs above St. Lawrence.

21. Melica uniflora. *Wood Melic Grass.* Woods and shady places.

22. Molinia cærulea. *Purple Melic Grass.* Cliffs above Niton.

23. Poa annua. *Annual Meadow Grass.* Pastures, waste places, walls, and everywhere.

24. Poa pratensis. *Smooth-stalked Meadow Grass.* Meadows and pastures; universally.

25. Poa trivialis. *Roughish Meadow Grass.* With the foregoing; abundantly.

26. Glyceria fluitans. *Floating Meadow Grass.* Wet places, ditches, and pools.

27. Sclerochloa loliacea (Triticum loliaceum). *Dwarf Sea Wheat Grass.* St. Catherine's Point.

28. Sclerochloa rigida (Poa rigida). *Hard Meadow Grass.* About Ventnor, and not uncommon.

29. Briza media. *Common Quaking Grass.* Meadows and pastures; very common.

30. Cynosurus cristatus. *Crested Dogs' Tail Grass.* Abundant in meadows and pastures.

31. Dactylis glomerata. *Rough Cocks'-foot Grass.* Meadows, pastures, and shady places; common.

32. Festuca ovina. *Sheep's Fescue Grass.* Dry pastures.

33. Festuca gigantea. *Tall Fescue Grass.* Woods and shady places.

34. Festuca pratensis. *Meadow Fescue Grass.* Meadows and pastures.

35. Festuca arundinacea (F. elatior). Moist ground; not common.

36. Bromus asper. *Hairy Wood Brome Grass.* Woods and thickets.

37. Bromus sterilis. *Barren Brome Grass.* Dry hedge-banks and waste places; common.

38. Bromus mollis. *Soft Brome Grass.* Meadows and pastures; very common.

39. Bromus racemosus. *Smooth Brome Grass.* With the above, of which it is probably only a smooth variety.

40. Brachypodium sylvaticum. *Slender False Brome Grass.*

41. Triticum caninum. *Fibrous-rooted Wheat Grass.* Fields and hedge-banks.

42. Triticum repens. *Creeping Wheat Grass* or *Couch Grass.* With the above.

43. Lolium perenne. *Perennial Darnel* or *Rye Grass.* Meadows and pastures; very common.

44. Hordeum murinum. *Wall Barley.* Way-sides and waste places.

Equisetaceæ.

1. Equisetum arvense. *Corn Horse Tail.* Moist fields and pastures.

2. Equisetum Telmateia (E. fluviatile). *Great Water Horse Tail.* Wet places.

3. Equisetum palustre. *Marsh Horse Tail.* Black Gang.

Filices.

1. Polypodium vulgare. *Common Polybody.* Common on rocks, walls, and trees.

2. Lastrea filix-mas (Aspidium filix-mas). *Blunt Shield Fern, Male Fern.* Pastures.

3. Lastrea spinulosa (Aspidium spinulosum). *Prickly-toothed Shield Fern.* Hedge-banks and woods.

4. Lastrea dilatata. *Broad Sharp-toothed Shield Fern.* Shady hedges and thickets.

5. Polystichum aculeatum (Aspidium aculeatum). *Soft Prickly Shield Fern.* Woods, hedges, &c.

6. Asplenium Adiantum-nigrum. *Black-stalked Spleenwort.* Hedge-banks and shady places; not unfrequent.

7. Asplenium Trichomanes. *Common Wall Spleenwort.* St. Lawrence.

8. Asplenium marinum. *Sea Spleenwort.* In extremely small quantity, and of very diminutive size; on rocks near Niton.

9. Scolopendrium vulgare. *Hart's Tongue.* Everywhere profusely, and of exuberant luxuriance throughout the Undercliff.

10. Pteris aquilina. *Common Brake* or *Bracken.* Barren, heathy, and rocky pastures; common.

11. Osmunda regalis. *Osmund Royal* or *Flowering Fern.* Wet boggy ground, near Black Gang.

12. Ophioglossum vulgatum. *Adder's Tongue.* Black Gang and Steephill; rare.

No species of the genus Lycopodium has hitherto been found in the Isle of Wight; and, consequently, this closes our notice of the flowering plants and ferns of the Undercliff.

Although I do not attempt to give any list of the Fungi of the Undercliff, I cannot omit noticing "Clathrus cancellatus." This very curious fungus is occasionally found in damp pasture grounds at Old Park; in Pelham Woods; and at Steephill. It has also occurred near Ryde, but has hitherto been confined in its British habitats to the Isle of Wight.

Before, however, dismissing the subject of botany entirely, we may just hint at some of the peculiarities connected with the growth of plants in this district; and also give some notice of the more delicate exotics which thrive well here.

Peas and strawberries, unless in unusually cold seasons, are produced much earlier than they are in general elsewhere. I have seen both at table in the first week of the month of May, which were grown in the open ground without any further protection than a light cover during the colder nights of March or April. New potatoes, likewise, are obtained at an early period.

While, however, the early fruits and vegetables, as well as the smaller shrubs and flowers, make their appearance sooner here than elsewhere; yet the foliage of the larger shrubs and trees is frequently more backward than is usual in the south of England. With us spring is commonly a short period as regards the vegetable world, and we burst into summer, as it were, suddenly.

Fruit in general ripens well, which is no doubt owing to exposure to the full influence of the summer or autumn sun, which, stimulating the proper juices, enables it to arrive at maturity. Grapes and figs ripen remarkably well in ordinary seasons, and I have gathered some of the latter weighing half a pound.

Annuals seed themselves most profusely, and it is not unusual to have two or three successions during the season from one sowing; indeed many annuals become weeds with us, and are not easily eradicated.

Many tender exotics frequently withstand the winter in the open ground of the Undercliff, and, amongst numerous others, the following examples may be given: —

Aloysia Citriodora. Grows out of doors, without any protection, *as a shrub*, and flowers profusely. There was a plant at Steephill a year or two since which had attained a height of *about eighteen feet!* I have one in my garden, the stem of which measures seven inches in circumference. The fragrant leaves usually remain on the branches until January.

Buddlea Globosa. Grows to a large size.

Bupleurum fruticosum forms fine bushes in the grounds at Steephill, and, together with equally large plants of the great shrubby orache (Atriplex), flowers freely.

Cineraria gigantea. Grows

strongly, and sometimes flowers abundantly about Christmas.

Clianthus Puniceus. Grows very luxuriantly, and usually flowers twice a year, namely, in June and December.

Escallonia floribunda rises to a tall shrub, and produces its fine tufts of white flowers in profusion.

Fuschias of various species, including some of the more tender, remain out of doors throughout the year without injury.

Geraniums of the more hardy kinds remain out during the winter, but of course (unless planted against a wall, and protected in severe weather), die to the ground. They come up very strongly during the summer, but do not flower except in a warm autumn. I have some which have remained out for four or five years without protection.

Heliotropes have occasionally lived through the winter, in the open border, during mild seasons.

Jasminum Revolutum. Grows to a large size, and withstands the winter without being protected.

Lotus Jacobæa. A plant of this species grew, as a large bush, for many years at Steephill.

Magnolias of several kinds grow to a large size, and flower well.

Myrtles thrive luxuriantly, as many a cottage garden in the neighbourhood testifies, and are rarely injured by our frosts.

Physalis Edulis. Grows well against an open wall, and ripens its fruit perfectly, which furnishes a very desirable addition to our tables during the latter months of autumn, and early winter.

Sesbania Grandiflora. Has grown for many years at Steephill.

Siphocampylus Bicolor. Usually withstands our winter in the open border, and flowers much more beautifully than when reared in a greenhouse.

Wisteria Sinensis. Flourishes well with us.

I might greatly enlarge this list, but I will only add the following :—

Orange trees planted against a wall at Steephill sur-

vive the winter; but they, of course, require the protection of mats during that season. Petunias and several kinds of verbenas also frequently survive the winter in the open border, and flower early in the spring. Mignonette may generally be found in flower in the Undercliff during every season of the year. Sweet peas and carnations continue to bloom usually until near Christmas, and a handsome bouquet may, in ordinary seasons, be gathered from the open garden until January has far advanced. I have counted nearly fifty species of garden flowers blossoming in the borders in December.

CHAPTER VIII.

TOWN, VILLAGES, INHABITANTS, ETC.

TWENTY years ago the Undercliff still presented a scene of romantic retirement, to charm the tourist who might be willing to encounter the rude accommodation it then afforded.

How changed is now the scene! Within these twelve years past a little town has risen, which boasts a handsome church and several chapels, together with a parsonage and schools; hotels, where Royalty has more than once been entertained; a bank and post-office, baths and libraries; paved paths and lighted streets; its precincts watched and warded; its shops attractive and not ill supplied.

Four stage-coaches now run daily throughout the year to Ryde, and, through Newport to the towns of East and West Cowes; and during the summer months the number is augmented to six. To this mode of conveyance are added several vans which convey both passengers and luggage, while numerous establishments where carriages and horses may be hired, complete the accommodation now afforded to the public.

Previous to 1828 Ventnor was a very small village, consisting of the New Inn as it was then called (built in 1800) situated under St. Boniface Down, and which, after becoming a boarding-house and hotel, under the name of the Montpellier Hotel, was at length converted into a private residence and named "Hillside;" "The Crab and Lobster," the "ancient hostelries" of the place, which, with some modern additions, still occupies its former site: Ventnor Farm, formerly inhabited by Lady Frances Tollemache, but now the residence of the "Father of the Undercliff," Joseph Hadfield, Esq., and called "The Grove." The mill, and a few fishermen's cottages and huts, completed what was then called Ventnor.

In 1828 the mason employed in the erection of Steephill Castle, built Cove Cottage in Belgrave Road; and thus originated the new village. Spring Cottage was next built, and this was quickly followed in succession by Sea Weed, Sea View, and High Bank, all of which still bear their original names. At the latter place a Wesleyan chapel was erected, but, from some want of skill in the architect, it was found to require alteration before it was completed; in attempting which, the structure fell down. Belle Vue succeeded these, and the nucleus of the little place gradually enlarged; until, in the course of about ten or twelve years, it began to assume the form of a town. Its requirements to meet the wants of visitors now becoming greater than the private contributions of a few spirited individuals for its improvement could any longer meet

it was deemed necessary to apply to Parliament for authority to constitute it a market town, and to levy rates for carrying out the improvements and alterations which the state of its streets, &c., demanded. That such a course was imperatively called for, may be instanced from the fact, that in bad weather its streets, if they could then be called such, were from the constant carting of stone for the purposes of building, together with other nuisances, rendered, with the exception of the main road, almost impassable to foot passengers, and totally so to carriages: and at that period, I myself measured a rut in Victoria Street a foot and a half deep! In short, the streets of Ventnor and *mud* were synonymous, and winter visitors were in consequence driven away to seek an asylum elsewhere, where they might enjoy the advantages of a mild climate without encountering the sloughs and rugged roads the village then presented.

In consequence of the necessity of an application to Parliament being so obvious to all, a public meeting was called in March, 1843, and though its unanimity was somewhat disturbed on private grounds as to the mode of carrying out the project, still all agreed that such a course was indispensable for the future welfare of the place. A committee was appointed, and a bill drawn up of so comprehensive a nature as, while it would add but little to the expense then incurred, would, it was supposed, meet any future necessities of the place, and prevent the expenditure of public money in obtaining another bill, or enlarging the powers of the

first. The bill was introduced into Parliament in the session of 1844, and met with an uncalled-for and harassing opposition, over which, however, it ultimately triumphed; although the expense incurred in consequence, crippled the resources of the place, and has consequently prevented many contemplated improvements from being carried into effect.

The activity and energy displayed by the commissioners under the Act, may now be evidenced by the circumstance, that, notwithstanding all the difficulties with which they had to contend, they have removed from Ventnor the opprobrium of its mud; have improved its streets, and widened them as far as their means would admit; have laid down convenient foot-pavements; constructed a large and efficient sewer throughout the main streets; and, but with very few exceptions, the appearance and condition of the town, when its streets are quiet on the Sabbath, would satisfy the most fastidious sanatory officer; while the decorum exhibited in them on that day cannot fail to strike the most superficial observer.

The church, which forms so conspicuous an object, was, together with the parsonage and schools, munificently founded by John Hambrough, Esq., the proprietor and erector of Steephill Castle. It was commenced in June, 1836, and was consecrated and opened for public worship on the 17th of July, 1837. The population of the place had so increased, that about four years ago the generous founder ministered still further to its wants, by adding galleries to the

church, thus affording additional accommodation for the poor of two hundred sittings.

The schools were first established by public subscription, in 1835, but being found totally inadequate to the increasing number of poor children, Mr. Hambrough entirely rebuilt and enlarged them, at his own expense, in 1837.

The original and only road into Ventnor from Ryde, until 1842, was that which passes by St. Boniface House, and down what is now called Spring Hill, which route has been followed, when describing the Undercliff, in the Second Chapter. As the town grew larger, the necessity of a further outlet became apparent, and the managers of the Ventnor Estate opened a new road, in 1843, from the top of High Street to St. Boniface Farm, which, on the passing of the Act, became a public highway, as did likewise a farm-road which had been previously repaired and improved, and which now leads, by a circuitous route, also to St. Boniface Farm and Stables, passing by Madeira Vale. The first of these two roads now forms the principal entrance into Ventnor, and the others are rarely used, except in proceeding from Bonchurch to Newport, or in going to any of the houses by which they pass.

The road to Newport is reached by three approaches, one of which branches off at the top of Spring Hill, and is joined, just at the Quarry, by the second, which runs near Elm Grove, and affords the accommodation of readier access to the centre of the town. The third commences at the western end of Belgrave Road, and

takes its course up the zig-zag way which passes at the back of the Ventnor Hotel. These different routes make the town of Ventnor, from the Newport Road, now of easy access; but, previously to 1843, the roads which descended from that point called Sloven's Bush, were narrow, steep, and dangerous. I have already mentioned, in a former chapter, that one which entered the Undercliff at Steephill; and the other, which passed by the house then called the New Inn, and afterwards Montpellier Hotel, though not quite so rugged, was still as prolific in accidents. This hill was lowered, and the road widened, (previous to the Act for Ventnor being obtained,) by the highway commissioners for the Isle of Wight, *assisted by private contributions of the inhabitants* of the then *village* of Ventnor and its vicinity, and the approach is now made easy and safe.

The well-known Mill at Ventnor, after having been much enlarged and improved some years before, was burnt down on the night of Shrove-Tuesday, March 7, 1848; but by the well-directed exertions of the inhabitants who had been aroused by the catastrophe, the dwelling-house was saved. This accident induced the commissioners of the town to provide, as far as lay in their power, against damage from any future occurrence of the kind; and an excellent and powerful fire-engine has been provided by them.

Within the past summer and autumn, a wide and commodious esplanade has been formed on the sea-beach, in the Cove, extending from the Cascade below

the Parsonage nearly to the Undercliff Baths. This will supply a want much felt by a large class of invalids who require a level space for a promenade; and the beauty of its situation cannot fail to attract the passing visitor.

Various propositions have been made for the purpose of establishing a pier, or landing-place, in Ventnor Cove, and a public meeting was held, in July, 1843, in order that some steps might be taken towards carrying out so desirable an object, and a fund was subscribed for the purpose of defraying the expenses of the undertaking. In consequence of this, an attempt was made to form, in the first instance, a kind of breakwater, which was constructed of the stones found on the shore, and fixed in such a manner as to allow the breaking of the sea the least power over them. It was placed at the western extremity of the Cove, a little below the Undercliff Baths; but the experiment failed, principally from the want of funds for carrying out the project in a sufficiently substantial manner. Enough, however, was done to prove that the plan is feasible, and one which it is to be hoped may be executed at a future time. The ruins may still be seen at low water, but the greater number of the stones of which it was composed, have been very improperly removed, for the purpose of repairing the sea-wall belonging to the baths.

The houses had formerly the reputation, and not without cause, of being slightly and badly built, and affording very imperfect accommodation; this charge

each succeeding year is freeing them from, and in the number of new houses lately erected, especial attention has been drawn to the comforts and requirements of invalids and visitors.

Having thus noticed the *town* of the Undercliff, we may now briefly glance at the villages it contains, the first of which is Bonchurch. This little village is no doubt of great antiquity, as is proved by its venerable little church; but other circumstances would seem to allow it a more remote niche in history. In preparing the ground for building at Mountfield, some sepulchral urns were discovered, inclosing the remains of incinerated bones, which appear to point out the spot as having belonged to some Roman station, or outpost; and this idea is favoured by the fact of the commanding position of its heights. Some works, apparently belonging to an ancient fortification, also exist near the edge of the cliff below East Dene, though much of them has been destroyed by the falling of the cliff within these few years. These ramparts have, however, been supposed by some to have been erected in the reign of Henry VIII. or Elizabeth, for the purpose of repelling foreign invasion.

A curious discovery has been made during the past November (1848) of the remains of a jetty or breakwater, on the shore below the church; this was discovered while removing some of the rocks on the beach, and consists of large piles of elm timber filled in between with bushes and plastic clay, of a description not met with in this part of the island. No mention

is made in any of the records of the place of the existence of such a structure, and its tradition is entirely lost to the oldest of the villagers. The rocks or stones by which it was concealed have occupied the same spot for certainly more than a century, and the piles themselves have lost all hardness of texture; and though they present the mark of the axe that formed them, as clean and well-defined as the day on which they were hewn, yet their substance can be cut with a knife without offering more resistance than that of a soft apple. I think it not improbable these remains are those of a breakwater or groyne, constructed for the purpose of protecting the cliffs, and with them the church, from the inroads of the sea; or for the sake of inclosing the little sandy bay which lies within it, called Monk's Bay, and thereby securing a good fishing ground.

The old church had for some years been deficient in accommodation for the increased number of the population, while its dampness rendered it very unfit for the class of persons who usually resorted to Bonchurch during the winter. To obviate these objections, it was determined that a new edifice should be erected, and a subscription was raised among the inhabitants of the parish for that purpose. The site was given by the Rev. James White, and the remainder of the ground required for the churchyard and schools was purchased and presented to the parish by Capt. and Lady Jane Swinburne of East Dene; and on 24th June, 1847, the first stone was laid by the late excellent and much-

lamented Rev. William Adams *, who, alas! did not live to see the pious work completed. He rests under the "shadow of the cross" in the churchyard of the Old church.

The sacred edifice was finished in the autumn of 1848, and on the 11th December of that year was consecrated by the Lord Bishop of Winchester, attended by the greater part of the clergy of the island, and in the presence of a crowded congregation. From that day the Old church, which had for so many centuries received within its walls, on each succeeding Sabbath, a Christian assembly, ceased to be opened for public worship, and the privileges attached to it, with the exception of the right of burial, were transferred to the new one.

St. Lawrence is the next little village which is to be noticed: this sweet spot, though altered by having the

* The pious author of several beautiful allegories, among which is an exquisite one, entitled "The Shadow of the Cross." To commemorate this, a raised cross has been placed over the stone which covers his remains, in such a manner that its shadow always falls on his grave, and he may be truly said to rest under "the Shadow of the Cross." He resided during the latter years of his life at Bonchurch, and was a great benefactor to the new church. "The Old Man's Home," which those who have once read can never forget, was written here, and the scene laid in the village and adjoining Landslip.

Among those who "after life's fitful fever, sleep well," within the sacred precincts of the old churchyard, slumbers all that now remains of what was once John Sterling! Those who knew him will appreciate and forgive the desire which prompts me thus to wish to preserve his memory from oblivion.

cottages of the poor rebuilt and made comfortable, has not been disfigured, and remains, with the exception of these alterations, nearly in its original state.

Its inhabitants have not much increased in number of late years, and they no longer follow the daring occupation of their forefathers, namely, that of smuggling. This used to be carried on to so great an extent, and so openly at one time, that it is related on one Sunday morning a congregation could not be assembled at the church, in consequence of all the villagers being employed in relieving a Dutch dogger, then lying off the shore of St. Lawrence, of her illegal cargo. The contraband trade, however, has not entirely ceased on the coast, and three poor Frenchmen were captured about four years since, together with their boat and "tubs," between St. Lawrence and Puckaster. The church has been spoken of in a former chapter; the little bell which graces its belfry was the gift of Sir Richard Worsley, and the stone arch over it, together with the porch, the little chancel, and the new pews, were added by its much-loved benefactor and revered patron the late Earl of Yarborough. The village of Niton being situated out of the Undercliff, with the exception of that portion which may be called the new village, and which has been already described, no notice of it here is necessary.

I shall now allude to the inhabitants of the district, who before the recent changes formed its population. "The lower orders of the people are generally tall, well-looking, and healthy; very little illness of any

kind prevails here, and we have been quite free from epidemics which have prevailed in other parts of the Island." This is an extract from the letter of a gentleman whose high talents and extensive opportunities for observation render him no mean authority; and his remarks were penned at a period antecedent to the immigration which has lately taken place from various parts of the country to this formerly sequestered spot.

In passing through this district we must not judge of the health and vigour of the labouring classes by the majority of those we meet. The original inhabitants were certainly a fine athletic race, and many may still be found whose manly forms and fine proportions are fitting the study of the painter or sculptor. The villagers of Bonchurch especially, are, generally speaking, stalwart and tall, and the women, when young, by no means deficient in personal beauty; the system of intermarriages, which here prevails, seems to have done little towards deteriorating the race.

History has recorded the courage and conduct of an inhabitant of this village of former days, which promoted him from being a poor village lad to the proud station of a British Admiral—I allude to Admiral Hobson. The spirit of daring still exists, and many a bold exploit was performed during the last war by the men of Bonchurch and the Undercliff.

The celebrated John Wilkes, who resided during

some of the latter part of his life at Sandown, is said to have remarked, when speaking of the social qualities of the Islanders in general, that they "disliked strangers, and hated each other." I must rescue the inhabitants of the Undercliff, at least, from the opprobrium thus cast upon the inhabitants of the Isle of Wight, and assert, that under a rude exterior and abrupt manner they possess a great deal of genuine kindness and good feeling; and though they may formerly have considered, in common with the generality of the inhabitants of our coasts, that the products of the frequent wrecks which then took place were lawful prizes, still they have not been wanting in very numerous instances of humanity and courage in preserving the shipwrecked mariner from destruction; and the noble conduct displayed in rescuing the survivors from the wreck of the ill-fated Clarendon furnishes us with an example.

That the Undercliff must be considered highly favourable to longevity, may be inferred from the advanced age to which a great number of its inhabitants arrive. Not a few may be found whose years have reached far more than the "age of man," and who are still in the enjoyment of comparative vigour and unclouded intellect. The village of Whitwell, a little to the north of the Undercliff, above St. Lawrence, boasts of having numbered among its inhabitants several individuals whose term of existence extended over 100 years. A woman of the name of

White died near that place some years ago, whose age was 103 years; and an old man of the name of Anthony Edmonds died there not many years since whose age amounted to 104.

The gates, which until this year past were placed across the road between St. Lawrence and the "Orchard," were attended during the summer by old men whose ages varied from nearly 80 to 90, and who thus endeavoured, by exciting the charitable dispositions of the numerous visitors, to obtain the means of supplying many little comforts which the pittance they received from their parish would not allow them to procure. One of these veterans, James Roach, still placed himself at the foot of Whitwell Shute during the past summer, and though he could offer no services as of old in opening the gate, and thereby hope for a small reward, yet endeavoured, by affixing to a board his great age, to excite the pity of the passing stranger, and receive his charitable mite.

The population of the Undercliff has rapidly increased within the last few years. In 1780 the parish of Newchurch, in which Ventnor is situated, contained 1505 inhabitants, of whom about 500 belonged to Ryde. At the same period Bonchurch contained 86, St. Lawrence 77, and Niton 267. Ventnor was not then named. In 1838 the then village of Ventnor counted a population of about 350 souls, which, at the census taken in 1841, had advanced to nearly 900; at the same period, Bonchurch gave a return of 302;

St. Lawrence of 114; and Niton numbered 611. In March, 1847, the number of inhabitants contained in the township of Ventnor alone amounted to 2069, exceeding by more than one-fourth the population of the whole of the extensive parish of Newchurch in 1780.

G. Woodfall and Son, Printers, Angel Court, Skinner Street, London.

BOUND BY
REMNANT & EDMONDS